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STUDIES IN BUSINESS FINANCING

THE PATTERN OF CORPORATE FINANCIAL STRUCTURE

A Cross-Section View of Manufacturing, Mining, Trade, and Construction, 1937

by

WALTER A. CHUDSON

NATIONAL BUREAU OF ECONOMIC RESEARCH
NEW YORK 1945

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PREFACE

THIS STUDY IS ONE OF A SERIES prepared under the Financial Research Program's Business Financing Project, an investigation of changes in the financial structure of American business, 1900-1940, begun early in 1940 with the support of grants from the Association of Reserve City Bankers and the Rockefeller Foundation.

The project has had the following objectives: first, to determine from statistical analysis of business accounting records the general character of the financing services obtained by business enterprise from financial institutions currently and in the past; second, to trace the structural and cyclical changes that have occurred in business credit demands since the turn of the century; and third, to describe the adaptations that institutions providing short- and medium-term credit to business have made in recent years in response to changing credit demands.

Work on these objectives has been organized into two divisions: one entitled "Changes in the Financing of Business Enterprise, 1900-1940", and devoted to the first and second objectives; the other entitled "Business Financing Tendencies and the Emerging Problems of Commercial Banks," and concerned primarily with the third objective, but also to some degree with the first. The procedure followed has been to develop, from separate bodies of primary materials, special technical studies whose findings are to be integrated into a single analysis. The present report is one of the technical studies made under the first division of the work.

When work on the Business Financing Project was initiated, no comprehensive tabulations of corporate financial data, compiled according to uniform standards and covering a long period of time, were available as a basis for analysis. The first problem, therefore, was to test the usefulness of existing compilations, and to build up new materials to supplement and extend those already available. With the cooperation of a number of public and private agencies, several additional samples of business financial data were developed from state tax report files, federal corporate income tax returns, industrial loan files of the Federal Reserve Banks of New York and Philadelphia, Dun and Bradstreet reports, bank credit files, and other sources.

Variations in the coverage and characteristics of the data thus assembled presented many statistical problems. As the analysis of our samples of data progressed, it became increasingly clear that we urgently needed a comprehensive picture, for one recent year, of the distinguishing financial features of incorporated manufacturing and trade enterprise, grouped by industry, size of corporation, and profitability. Detailed knowledge of the pattern of variation of balance-sheet accounts, systematic and otherwise, according to industry, size of corporation, and profitability, would aid in the comparative interpretation of our various samples of corporate financial data for long periods, since both the quantity and quality of these historical data diminish as one moves back in time.

Walter A. Chudson, who has collaborated in the project from the outset, undertook the responsibility for preparing such a study, and after some exploration he came to the conclusion that the most promising sources on which to base the study were the *Statistics of Income* of the Bureau of Internal Revenue and the *Statistics of American Listed Corporations* of the Securities and Exchange Commission. The year 1937 was selected as the one for reference analysis because it was in general a year of high business activity, and our long-period study of changes in financial structure was being developed on the basis of data pertaining to selected years of "peak" business activity over the period 1900-1940. In addition, the compilations for 1937 were the most recent ones available when the study was begun, and had the advantage of providing a more detailed classification of balance-sheet accounts, particularly current liabilities, than the tabulations for previous years. Dr. Chudson has also used data for other years, notably 1931, in his study, but his use of such data has been largely for purposes of testing the findings from his more intensive analysis for 1937.

Dr. Chudson has been concerned with a variety of interesting and highly relevant questions. How do manufacturing and trade corporations, differing in size and profitability and belonging to different industries, vary with respect to the composition of their assets and liabilities? Do they differ systematically in respect to inventory holdings, cash, and accounts receivable? Do large corporations have a higher turnover of their current or working assets than do medium-sized and small corporations? Is the proportion of current assets and liabilities more directly related to type of industry or to size of corporation? How are different levels of industrial profitability reflected in balance-sheet ratios? Is the proportion of short-term debt—i.e., trade credit and notes payable to banks and other institutions—related more closely to business holdings of inventory, or to other characteristics?

In answering such questions Dr. Chudson has employed the ratio method of balance-sheet analysis, using as his bases both total assets and sales. This method, though conventional, is especially well adapted to the questions on which Dr. Chudson has focused his analysis. In evaluating his findings, it must be recalled that his objective is limited to determining the cross-section pattern of variation in financial structure with respect to industry, corporate size, and reported profitability. The data with which he has worked have not been all that one would hope to have, and they were not compiled to order. The significance of the findings, however, fully justifies their use for the purposes in mind. Appendices A, B, C, and D contain a detailed discussion of the characteristics of the data and of the methods of analysis, which will be of particular interest to technical readers in appraising the findings.

We are indebted to the Bureau of Internal Revenue and to the Securities and Exchange Commission for help in the assembly of materials for this study. The Bureau of Internal Revenue permitted us to make transcriptions of tables covering the financial statements of minor industrial divisions from its *Source Book of Statistics of Income.* The Division of Research and Statistics of the SEC kindly prepared for our use some supplementary tabulations of data for corporations covered in the Division's Survey of American Listed Corporations for 1937.

The tables on which the analysis is based are not contained in this volume. They are to be made available, along with other basic corporate financial data compiled under the Business Financing Project, in a separate volume entitled *Corporate Financial Data for Studies in Business Finance.*

RALPH A. YOUNG
Director, Financial Research Program

January 1945

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In this study I have profited considerably from the generous counsel and encouragement of Ralph A. Young, Director of the National Bureau's Financial Research Program, and of Winfield W. Riefler, Chairman of the Committee on Research in Finance.

In preparing the manuscript, which is one of a series dealing with the financial structure of American corporations, I have gained much assistance from the constant interchange of ideas with my colleagues, Sidney S. Alexander, Carl Kaysen, Albert R. Koch, Charles L. Merwin, and Raymond J. Saulnier, who have been working on related aspects of the subject. I am especially grateful to Carl Kaysen for advice in dealing with statistical problems.

I also owe much to the statistical and clerical staffs of the Financial Research Program for the cooperation which has made possible such a large-scale quantitative analysis, particularly to Sophie Polah, under whose direction the tables were prepared and checked, to Renée Courtney, who put the tables in their final form, and to Helen Morphy, who executed the charts. In addition I am indebted to Lorine Pruette, who edited a preliminary version of the manuscript, and to Dorothy Wescott, who was in full charge of the editing for publication.

A substantial part of the data has been derived from unpublished sources, and I wish to express my thanks to E. D. White, of the Bureau of Internal Revenue, and to Raymond A. Goldsmith, of the Securities and Exchange Commission, for making these materials available to me.

Walter A. Chudson

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STUDIES IN BUSINESS FINANCING

THE PATTERN OF CORPORATE FINANCIAL STRUCTURE

A Cross-Section View of Manufacturing, Mining, Trade, and Construction, 1937

NBER FINANCIAL RESEARCH PROGRAM

· I ·

A SURVEY OF CORPORATE FINANCIAL STRUCTURE

THE APPRAISAL OF THE FINANCIAL position of an enterprise by examination of its balance-sheet ratios has long engaged the attention of credit analysts and continues to be an important phase of credit granting. Use of the balance sheet as a basis for measuring and predicting solvency and earning power has tended, however, to obscure the light that the financial statement may shed on a broader range of questions of interest to the general economist, the banker, and the student of the capital market.

In what way does the structure of assets and liabilities of a given concern reflect the kind of industry in which a concern is engaged, the concern's size and level of profitability? Are there significant differences in the use of short-term, long-term, and equity financing among various classes of business enterprise? Is the use of bank credit concentrated more strongly in certain sectors of the business community than in others? Do some concerns rely more than others on trade credit? Are there significant relationships between short-term assets and short-term liabilities; for example, do concerns with a high proportion of inventories tend to have a high proportion of notes payable? Is corporate liquidity, as reflected by the current ratio, associated with the industry, size, or profitability of a corporation? Finally, are there any elements in the corporate balance sheet, either on the asset or the liability side, whose range of variation is so narrow that it is possible to speak of a "normal" pattern of financial structure?

For the analysis of such questions we have assembled a comprehensive tabulation of corporate balance-sheet items primarily for the years 1931 and 1937, covering the fields of manufacturing, trade, mining, and construction, but excluding such industries as service, utilities, and finance—groups whose financial structure is typically different from that of the industries selected for analysis. The original data have been drawn largely from published or publicly available compilations of the Bureau of Internal Revenue, where they appear as dollar aggregates of the various balance-sheet accounts, classified by industry, by size of assets, and by corporations with and without net income, which for convenience we shall call "income" and "deficit" corporations, respectively. Each component of the balance sheet has been studied for differences that may be revealed in the financial structure of (1) the various industries, (2) corporations of different sizes within the same industry, and (3) corporations with net income compared with those having no net income. We have confined attention mainly to the 1937 data, which are the most complete; where possible, however, comparisons have been made between 1937 and 1931, to appraise the stability of the balance-sheet pattern over a short period of time.[1]

When the financial structures of selected classes of concerns are compared, each balance-sheet item must be related to some common basis. This basis may be either total assets or the volume of operations, measured most conveniently by sales. In order to provide a general picture of the relative size of the various components of the balance sheet, we shall, in the chapters that follow, present each item as a percentage of total assets. In addition, items whose turnover is of great interest will be related to the volume of sales; these include the various current assets and liabilities, fixed capital assets, and total assets.[2]

Both total assets and sales have certain shortcomings as bases of comparison. If a given item forms a large percentage of total assets, other accounts are, of course, relatively small; yet in evaluating the importance of differences in particular ratios based on total assets there is a misleading tendency to think of each ratio as independent. A second, although minor, defect in the use of total assets as a denominator is the possibility of misleading comparisons when the renting of fixed capital assets (usually business premises) is more common among some classes of concerns than among others. This exaggerates the importance of current assets, particularly in the case of retail trade.

---

[1] For a complete description of the sources used, and a discussion of the characteristics of the data, see Appendix A.

Extensive tabulations pertaining to the corporations covered in the present study may be found in a separate volume, available to those who wish to examine the data in detail: National Bureau of Economic Research (Financial Research Program), *Corporate Financial Data for Studies in Business Finance* (ms. 1945), hereafter referred to as Data Book.

[2] For a discussion of the degree to which the pattern of financial ratios [illegible] differ according to the basis of comparison, total assets or sales, see Appendix [illegible]

Sales also have features which affect the interpretation of ratios. The sales data refer to operations of a whole year, while the balance-sheet data refer to the year end. Distortions in comparisons therefore arise when business conditions are changing rapidly or when seasonal variations of balance-sheet items are of different patterns and amplitudes. Adjustment for seasonality cannot be made at present because we lack comprehensive balance-sheet and sales data for quarterly or more frequent intervals.

Three general matters of interpretation deserve brief mention here. First, while cross-classification of the data according to industry, size, and profitability provides the basis for an appraisal of financial differences according to these criteria, the industrial comparisons are inevitably affected to some extent by the fact that industries differ also in their average asset size and profitability. Similarly, size comparisons within major industrial groups involve classes which differ not only in size but to some extent in profitability. Secondly, our data are in the form of dollar aggregates for each class of corporations, and we therefore must apply methods of comparison appropriate to such data and forego an examination of variations in the balance-sheet ratios of individual concerns *within* each class. Tests have been applied, however, which justify the conclusion that these two qualifications do not substantially affect the results.[3] Finally, the balance sheets from which the data are drawn are unconsolidated, as required by law. This reveals the extent of intercorporate investment but at the same time affects the relation of the other assets to the total.[4]

BASIC FEATURES OF FINANCIAL STRUCTURE

We may summarize the basic findings of this study most conveniently in terms of the questions that at the outset we planned to investigate.

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[3] For a description of the statistical devices used to test the significance and stability of the results, see Appendix B, pp. 126-28.

[4] See Appendix C for a discussion of consolidated and unconsolidated balance sheets.

(1) In what way does the structure of assets and liabilities of a given concern reflect the kind of industry in which a concern is engaged, the concern's size and level of profitability?

The range of variation by industries for a number of balance-sheet ratios indicates that the industry in which a corporation falls is a significant factor in determining the structure of the corporation's balance sheet. Differences among industries in certain balance-sheet items, such as inventory and receivables, can be traced to such factors as the length and technical character of the production process, the durability of the product, the degree of vertical integration, and the amplitude of seasonal fluctuations. On the other hand, variations in current liabilities and intercorporate investments with few exceptions appear to be largely the result of random forces or institutional arrangements quite independent of industrial characteristics of the type cited above. This is particularly true among the subdivisions of manufacturing.

The financial structure of a corporation within an industry is also influenced by the size of the corporation. For the different balance-sheet ratios, the variations as corporate size increases are most pronounced among corporations with assets ranging up to $5,000,000. Above this level the movements are less definite, and, in the largest size brackets, appear to reflect the characteristics of a few dominant firms, with diversified output, whose classification in a particular industry is somewhat arbitrary.

Our findings confirm generally held views regarding the association of profitability and corporate financial liquidity. This association is largely determined by differences in the proportion of current liabilities of profitable and unprofitable enterprises; the proportion of current assets of income and of deficit concerns is strikingly similar. Intercorporate investments and surplus are significantly greater in profitable than in unprofitable concerns.

(2) Are there significant differences in the use of short-term, long-term, and equity financing among various classes of business enterprise?

The reliance on short-term and long-term debt varies considerably from industry to industry, and the differences are greater for short-term than for long-term debt. Variations in the proportion of equity among industries are relatively narrow.

Changes in the proportion of common and preferred stock as size of corporation increases are not so pronounced as those of surplus; the proportion of surplus grows consistently with the size of concern. Among deficit corporations this movement largely follows variations in the rate of loss. While there is little variation in the rate of profitability among large and small concerns of the income group, the longer average life of the larger corporations appears to be an important factor contributing to this result.

(3) Is the use of bank credit concentrated more strongly in certain sectors of the business community than in others?

Short-term credit in the form of notes payable to banks comprises a smaller part of the liabilities of large than of small corporations, and also a smaller part of the liabilities of profitable than of unprofitable concerns, within comparable industrial groups. The turnover of bank credit, however, does not vary substantially among corporations of different size. This behavior is probably based on the greater degree of vertical integration among large concerns. In relation to value added by production, bank borrowing may be expected to decline significantly with increased corporate size.

(4) Do some concerns rely more than others on trade credit?

Both accounts receivable and accounts payable display wide industrial variations. A substantial part of these variations is undoubtedly explained by financial practices developed over many years, such as the factoring of receivables. But for certain industries the volume of trade credit extended is directly related to the perishability of the product and the volume of trade credit received to the length of the production process.

When comparisons are made by size of corporation, we find that the large concerns show a slight tendency to extend trade credit for a longer period than do small concerns. Generally, large and small corporations rely to about the same extent on trade credit to finance their current output. However, as with notes payable, this behavior would appear to be quite consistent with a decline in accounts payable in relation to value added by production as corporate size increases.

As would be expected, the turnover of accounts payable is greater among income than among deficit corporations. In contrast, the turnover of accounts receivable is approximately the same in both groups of corporations.

(5) Are there significant relationships between short-term assets and short-term liabilities?

Industries with large inventory holdings tend to have a large volume of notes payable, and vice versa. But when corporations are classified by size or by profitability, no systematic relationship between inventory and notes payable is found.

Among the industrial divisions, current assets and current liabilities as a whole tend to show the same variations. The ratio of both current assets and current liabilities to total assets declines with size, but the liabilities decline the more strongly. As between profitable and unprofitable corporations of the same size and industry, total current assets form only a slightly larger proportion of total assets among income than among deficit corporations, while current liabilities are considerably smaller among income concerns.

Finally, among the various industrial and size classifications, notes payable do not show any tendency to substitute for accounts payable. In the case of cash and marketable securities, which might, to a certain extent, also be considered substitute types of balance-sheet accounts, there is some tendency among the larger concerns for cash to be replaced by marketable securities.

(6) Is corporate liquidity, as reflected by the current ratio, associated with the industry, size, or profitability of a corporation?

The behavior of the current ratio indicates that liquidity varies widely among industries; that liquidity tends to increase as corporate size increases; and that profitable concerns, when compared with unprofitable, have a higher degree of liquidity.

(7) Are there any elements in the corporate balance sheet, either on the asset or the liability side, whose range of variation is so narrow that it is possible to speak of a "normal" pattern of financial structure?

The wide range of variation among financial ratios indicates clearly that there is no normal or typical pattern of financial structure for the economy as a whole. Available data indicate, however, that within particular industry, size, and profitability groups there is a clustering of ratios. As criteria for credit analysis, therefore, financial ratios take on significance only when compared within a given class of concerns or when examined for the same group of firms over a period of time.

In general, the importance of industry, corporate size, and profitability as determinants of financial structure varies among the several balance-sheet accounts and also according to the basis of comparison, sales or total assets. None of the three factors may be said to dominate the pattern of financial structure.

Finally, the data which we have analyzed indicate that the comparative features of financial structure are stable over short periods of time, despite the effect of business fluctuations on current assets, current liabilities, and surplus.

INDUSTRY, SIZE, AND PROFITABILITY AS DETERMINANTS OF FINANCIAL STRUCTURE

The preceding questions have been answered here only in the most general terms, since each of the following chapters provides a detailed account of the pattern of a particular balance-sheet account with respect to industry, size, and profitability. The several chapters, however, will be of varying interest to different readers; therefore, a summary of the pattern of financial structure, as outlined in Tables 1 and 2, is desirable.

Industrial Variations

Among such broad industrial groups as public utilities, railroads, manufacturing, and trade, differences in the structure of both assets and liabilities have been widely recognized. Public utilities, for example, require a much smaller proportion of current assets than do manufacturing concerns, while manufacturing concerns in turn generally have smaller current requirements than have corporations in wholesale and retail trade. Short-term liabilities of these four groups display a similar pattern. Within the industrial subdivisions of manufacturing, trade, mining, and construction, however, our findings reveal a very complex pattern. Certain branches of manufacturing have a financial structure more similar to that of certain types of trade than to other branches of manufacturing. Furthermore, the relative range of variation among industrial subdivisions is by no means the same for the several balance-sheet accounts. (See Table 2, Column 4.)

Table 1—COMPARISONS OF RATIOS OF BALANCE-SHEET ACCOUNTS, 1937, BY INDUSTRY, SIZE, AND PROFITABILITY

Ratio (1)	*Relative Variation of Ratio Among Industries*[a] (2)	*Movement of Ratio as Size of Corporation Increases* (3)	*Ratio for Profitable Compared with Unprofitable Corporations* (4)
Ratios to Total Assets			
Cash	Moderate	Falls	Profitable—higher
Government securities	Wide	Rises	Profitable—higher
Cash plus government securities	Moderate	Irregular	Profitable—higher
Receivables	Wide	Falls	Little difference
Inventory	Wide	Irregular	Little difference
Fixed capital assets	Moderate	Rises	Profitable—lower
Other investments	Wide	Rises	Little difference
Notes payable	Wide	Falls	Profitable—lower
Accounts payable	Moderate	Falls	Profitable—lower
Other liabilities	Wide	Falls	Profitable—lower
Long-term debt	Wide	Irregular	Profitable—lower
Capital stock	Narrow	Falls	Profitable—lower
Surplus	Narrow	Rises	Profitable—higher
Net worth	Narrow	Rises	Profitable—higher
Ratios to Sales			
Cash plus government securities	Moderate	Rises	Profitable—higher
Receivables	Wide	Mfg.—Irreg. Trade—Rises	Little difference
Inventory	Wide	Mfg.—Rises Trade—Irreg.	Little difference
Fixed capital assets	Wide	Mfg.—Rises Trade—Irreg.	Profitable—lower
Notes payable	Narrow	Irregular	Profitable—lower
Accounts payable	Wide	Irregular	Profitable—lower
Total assets	Moderate	Rises	Profitable—lower
Other Ratios			
Current assets/current liabilities	Moderate	Mfg.—Rises Trade—Irreg.	Profitable—higher
Invested capital/capital assets	Moderate	Irregular	Profitable—higher
Net income/net worth	Wide	Inc. corp.[b]—Falls Def. corp.[b]—Rises	. . .

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[a] Based on index of relative variation, Table 2, Column (4).

[b] Inc. corp. = Income corporations.
Def. corp. = Deficit corporations.

Among the industrial divisions that we have studied,[5] the two closely related asset accounts—(1) cash and (2) cash plus marketable securities—when expressed as percentages of total assets show a range of variation that is narrower than that of most of the other asset items (Table 2, Column 4). The range of the ratio of cash to total assets is not surprising, since all industries require a minimum cash fund for current operations, while the factors setting the upper limit are fairly similar throughout the economy. Variations of the ratio for cash plus marketable securities are roughly similar to those of cash alone. Although marketable securities held by various industrial groups show wider relative variations than do cash, their volume in 1937 had been reduced to negligible proportions following the liquidation of the depression years. In striking contrast, the holdings of marketable securities in 1931 approximated those of cash in many industries, and in some cases they actually exceeded cash holdings.

Inventory and receivables exhibit wide variations among industries, in both absolute and relative terms. The broad range of inventory holdings appears to depend largely on the technical character of the production process, particularly its length (as, for example, in tobacco, shipbuilding, and the engineering trades, all of which have high ratios). Other factors of apparent importance are the relationship of the industry to its sources of raw materials and to its selling outlets, and the seasonal pattern of the industry as reflected in calendar year-end balance sheets. Variations in the proportion of receivables evidently depend largely on the institutional relations with an industry's markets, which have been developed over a period of years, as well as on such specific factors as the durability of the product, since producers of certain perishable products (e.g., food and beverages) often extend a smaller volume of trade credit than other industries.

Although investments in plant and equipment display a smaller degree of industrial variation than do inventory and receivables, the great variety of technical requirements for fixed capital pro-

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[5] The Bureau of Internal Revenue has classified corporations into a large number of so-called minor industrial divisions, of which we have selected 61 for comparison in our study. These 61 divisions, which are grouped as indicated below, are listed in Appendix E.

Manufacturing: 47 divisions
Trade: 5 divisions
Construction: 2 divisions
Shipbuilding: 1 division
Mining and Quarrying: 6 divisions

Table 2—Range of Variation of Balance-Sheet Ratios among Minor Industrial Divisions,[a] 1937 (in percent)

Ratio (1)	*Range* Low (2)	*Range* High (2)	*Median* (3)	*Index of Relative Variation*[b] (4)
Ratios to Total Assets				
Cash	1.4	13.0	6.2	35.5
Government securities	.1	4.9	1.8	61.1
Cash plus government securities	3.3	16.7	8.2	41.5
Receivables	5.5	37.9	13.7	58.4
Inventory	.5	47.5	22.7	62.6
Fixed capital assets	4.9	74.4	34.6	47.4
Other investments	5.3	25.6	12.6	72.2
Notes payable	1.2	16.6	5.2	69.2
Accounts payable	4.4	29.4	7.6	43.4
Long-term debt	1.2	35.9	6.9	78.3
Capital stock	27.5	66.1	47.7	16.1
Surplus	6.1	51.7	25.2	32.1
Net worth	42.7	84.9	75.4	18.7
Ratios to Sales				
Cash plus government securities	1.7	19.6	7.7	53.2
Receivables	4.9	28.0	12.7	59.8
Inventory	4.7	38.5	18.2	57.7
Fixed capital assets	3.8	186.3	30.6	84.6
Notes payable	.8	20.5	4.8	37.5
Accounts payable	2.5	23.4	7.7	59.7
Other liabilities	1.0	14.7	3.9	94.9
Total assets	30.6	239.2	94.7	48.6
Other Ratios				
Current assets/current liabilities[c]	.6	5.1	2.5	40.0
Invested capital/capital assets[c]	1.1	10.8	2.2	45.5
Net income/net worth	−7.7	14.5	5.8	70.5

[a] For a list of the minor industrial divisions, see Appendix E.

[b] Interquartile range as a percentage of median. See Appendix B, p. 128, for a further discussion of this measure.

[c] In times.

duces a far from uniform pattern. Investments in affiliates are characterized by a greater range of variation than fixed capital assets, but unlike the latter show little or no relation to easily identifiable industrial characteristics. Since intercorporate investments are not essential for carrying on business operations, the amount held clearly depends on decisions of financial policy, which vary more from one concern to another than among industries of particular types.

On the liabilities side of the balance sheet, the range of industrial variation is considerably wider among the items representing indebtedness than among the equity accounts. Manufacturing as a whole has a smaller proportion of current liabilities than trade, a feature which appears to be related to the comparatively smaller volume of current assets. Similarly, among the subdivisions of manufacturing, there is a significant parallel relationship between the volume of current indebtedness and the capital requirements for the financing of inventory and receivables. Notes payable, reflecting the optional nature of this source of funds, show a greater variation than accounts payable; and, likewise, sizable industrial differences in the ratio of long-term debt to total assets reflect the optional character of this liability account in the financial plan of an enterprise. Analysis reveals that the proportion of long-term debt shows some tendency to vary in the same way as the proportion of fixed capital assets.

The inter-industrial range of net worth and its two components, capital stock and surplus, is comparatively narrow, Accordingly, an inspection of industrial characteristics does not provide very significant clues to the reasons for variations in these balance-sheet items. While this is true of the various subdivisions of manufacturing, it is, of course, less applicable to broad industrial groups such as manufacturing, trade, and public utilities. Among these broad groups the differences in asset structure as between current and fixed assets are so great that they have a perceptible effect on the proportion of invested capital, as contrasted with short-term liabilities in the form of notes and accounts payable.

The turnover of balance-sheet items, expressed through ratios based on sales, in most cases shows a range of variation among industries which is somewhat wider than that of ratios based on total assets. This fact serves further to emphasize the significance of industrial requirements and operating standards in the determination of corporate financial structure. It is important to note, in this connection, that ratios based on sales display industrial rankings which are frequently dissimilar to those of ratios based on total assets. The fact that an industry has a comparatively small percentage of notes payable to total assets, for example, does not mean necessarily that the turnover of notes payable is relatively high. Disparities in the degree of vertical integration, in profitability, and in the length of the production process may all contribute to produce differences in the industrial rankings of the two types of ratios.[7]

Variations with Corporate Size

A comprehensive survey of financial structure with respect to corporate size is of particular interest in view of discussions in recent years of the financial characteristics and problems of "small business," since these discussions assume that significant financial differences exist among corporations of varying sizes.

Among the asset items of the balance sheet, investments in affiliates when expressed as a percentage of total assets rise steadily as size of corporation increases. Large concerns are in a much better position than small to avail themselves of whatever advantages accrue from the holding of such investments. This tendency is revealed sharply in the present analysis, because of the use of unconsolidated balance sheets.[8] For many industries, fixed capital assets also show a tendency to rise, but the upward movement is much less marked than in the case of intercorporate investments. Were the balance sheets in consolidated form, the rise in the proportion of fixed capital assets would, of course, be more pronounced.

While total current assets as a percentage of total assets decline as size of corporation increases, certain individual current items do not conform to the general pattern. (See Table 1, Column 3.) Marketable securities tend to rise substantially with corporate size, while the sum of cash and marketable securities displays irregular variations. The rise of marketable securities no doubt reflects the fact that it is less economical for small concerns than for large to employ this type of liquidity reserve. For inventory the range of variation is not very great and the movement of the ratio is frequently irregular; the largest proportion of inventory is found among medium-sized concerns. The ratio of cash to total assets declines slightly as size of corporation increases, while the proportion of receivables declines more sharply. Just as the intercorporate investments included in unconsolidated balance sheets tend to reduce the rise of fixed capital assets with increasing size, so they may accentuate the decline in current items. However, even when expressed on the basis of total assets minus intercorporate investments, the current accounts as a whole decline with size, being dominated largely by the decline in receivables.

Among the liabilities, the general pattern of financial structure is dominated by the substantial increase of net worth, particularly surplus, as asset size rises, with a complementary and pronounced decrease in current liabilities. The decline in notes and accounts payable appears to confirm the frequent assertion that large concerns tend more commonly than small to employ non-current sources of funds to finance their working capital requirements. Long-term debt does not show a very consistent variation with size among the income corporations; among the deficit corporations, however, the ratio rises appreciably as corporate size increases.

The rise of the ratio for net worth occurs consistently among both income and deficit corporations. Within the income group, the upward movement probably reflects the greater stability and age of the large concerns; the small size classes contain a substantial proportion of corporations whose average life is short and whose opportunity to reinvest earnings, in the volume that is characteristic of the large firms, is therefore comparatively small. In the deficit group, the basic factor influencing the upward movement is no doubt the enormous unprofitability of the small concerns. Within a single year all of the pre-existing surplus may be wiped out, or even turned into a deficit.

Among the various manufacturing industries, the current ratio generally rises as corporate size increases. This increase in corporate liquidity reflects a more pronounced decline in the current liability items than among the current asset items, as size of corporation becomes larger.

A striking feature of the variations in financial structure with corporate size is the contrast between ratios based on total assets and those based on sales (Table 1, Column 3). The general nature of this difference is revealed by the movement of the ratio of total assets to sales, which indicates a steady decline in turnover as asset size increases, particularly among the subdivisions of manufacturing. This behavior is best analyzed in terms of the turnover pattern of the individual assets. Among manufacturing corporations, the pronounced rise in the inventory/sales ratio as size increases appears to be associated with the greater extent of vertical integration among the large concerns, which would increase the proportion of goods-in-process to the final value of the output. The rise of the fixed capital/sales ratio among manufacturing industries also could be attributed to the influence of vertical integration. A final factor influencing the movement of the total assets/sales ratio is the volume of intercorporate investments, as revealed in the unconsolidated balance sheets. These investments are not closely related to the volume of operations and therefore contribute strongly to the reduced turnover of total assets as size increases.

A reduced turnover of inventory and of fixed capital assets as size increases is not characteristic of wholesale and retail trade, however; and a contrast between manufacturing and trade corporations may also be noted in the turnover of receivables. The turnover of receivables declines—i.e., the average collection period lengthens—as corporate size increases in both wholesale and retail trade; in the latter case, this movement probably reflects the credit sales of large department stores. In most branches of manufacturing, however, the turnover of receivables varies only moderately with size, indicating that receivables are closely linked to sales, unlike cash, inventory, and fixed assets.

The turnover of notes and accounts payable shows remarkably little tendency toward systematic variation with corporate size, indicating that short-term credit is "used" to about the same extent in both large and small concerns. This result is of particular interest since much emphasis has been placed on the tendency, noted above, for notes and accounts payable as a proportion of total assets to decline substantially as corporate size increases. If the "use" of short-term credit were measured on the basis of value added by production, however, we should probably find a decline in the use of short-term credit as size of corporation increases, but no adequate statistics are currently available to test this hypothesis.

Variations with Profitability

Classifying corporations into those with and those without net income, we find on the asset side of the balance sheet that a high degree of liquidity in the form of cash and reserves of marketable securities is associated with a high level of profitability. On the other hand, the proportion of receivables, and also of inventory, to total assets shows remarkably little difference between the income and deficit groups of corporations in the same industry. The same is true, furthermore, of the turnover ratios for receivables and inventory. The absence of a higher turnover of inventory among income-earning corporations than among deficit concerns is hardly in accordance with general expectations, and further investigation shows that 1937 was not a typical year in this respect. In 1931 and all other years in the intervening period, income corporations did have a more rapid turnover of inventory, indicating that the 1937 data reflect the inventory boom and the sharp recession that followed, which left income-earning corporations particularly overstocked in relation to their unexpectedly curtailed sales volume. The 1931 ratios for receivables, on the other hand, present the same features as those for 1937, suggesting that the similarity of income and deficit corporations is not a product of the particular characteristics of the year-end of 1937, but reflects rather the close link between receivables and sales.

While fixed capital assets form a smaller portion of total assets among income than among deficit corporations, this feature would appear to have little independent significance. The turnover of fixed capital assets among the income group is considerably greater than among the unprofitable concerns, which is in accordance with expectations.

Differences in corporate earning power appear to have a more pronounced effect on the current liabilities than on the current assets. The deficit corporations are considerably heavier borrowers on short term, measured on the basis both of total assets and of sales. Furthermore, deficit corporations have a larger proportion of accrued liabilities than have concerns earning a net income. Therefore, the current liabilities of deficit corporations as a whole are substantially greater in relation both to assets and to sales than those of the income group. Since there is relatively little difference in the proportions of the *total* current assets of the two groups, the ratio of current assets to current liabilities—which has traditionally been used as a symptom of solvency and profitability—is substantially higher among profitable than among unprofitable corporations, and it is worth noting that the basis of the higher ratio for income concerns lies in differences in the current liabilities.

Complementing the behavior of current liabilities, invested capital as a whole forms a substantially greater proportion of total liabilities in the profitable than in the unprofitable corporations. But this feature of financial structure is almost entirely related to the much greater proportion of surplus among the profitable concerns. The proportion of long-term debt is higher among the deficit than among the income corporations. The ratio of capital stock to total liabilities moves more or less inversely with the ratio of surplus, particularly among small corporations in which the difference between the surplus of profitable and unprofitable companies is particularly great.

On the basis of a comparison of data for 1931 and 1937, years of very different profit levels, it may be stated tentatively that shifts in the general level of profitability leave the comparative differences between the financial structure of profitable and unprofitable corporations unchanged wherever such differences are appreciable—with the exception of the turnover of inventory.

• 2 •

INVENTORY

EXPLORATION OF THE STRUCTURE of the balance sheet may well begin with an analysis of inventory holdings. Not only is inventory typically larger than any other of the current assets or any of the current liabilities of nonfinancial corporations—being rivaled only by receivables—but inventory holdings also may be regarded as a possible key to the composition of the other current items. The increasing attention given in the analysis of business conditions to inventory fluctuations reflects the view that inventory is a strategic element in the flow of industrial production. With respect to financial arrangements, this emphasis suggests that changes in other current assets and, particularly, in current liabilities may be looked upon partially as adjustments to prior decisions affecting inventory holdings.

The relationship between the expansion and contraction of inventory and the fluctuations in other balance-sheet items has been extensively analyzed in companion studies in the present series. Our interest here centers upon the question whether such relationships are revealed in the static, cross-section pattern of financial structure. For example, are relatively large inventory holdings associated with a large volume of notes and/or accounts payable? This type of question will be taken up in Chapter 4. In the present chapter we direct attention to the general variations of inventory holdings among corporations of different industries, size, and profitability.

As with the other current assets and liabilities, comparisons of inventory holdings with both total assets and sales are of value.[1] Of the two comparisons, however, that with sales is of greater interest for measuring the relation of inventory to "financial requirements" and to production; consequently, the following discussion allots a subordinate position to inventory as a percentage of total assets.

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[1] Inventory as a percentage of sales is not an accurate measure of the relationship between inventory and production, since the margin by which sales exceed value added by production varies among different industries. As a guide to financial requirements, however, sales are more significant than value added by production.

INDUSTRIAL VARIATIONS

In the majority of industrial divisions of manufacturing, mining, and construction inventory amounts to between 10 and 25 percent of sales (Chart 1). For all industrial divisions (income and deficit corporations combined), the ratio varies between extremes of 5 and 39 percent, with a median value of 18 percent. (See Table C-28 in Data Book.) Interestingly enough, a number of minor industrial divisions which make very diverse types of products have similar turnover ratios. On the other hand, several major industrial groups—for example, "food" and "textiles"—exhibit a wide range of variation in the inventory turnover of the minor divisions within those groups. Chart 1 reveals that the range of variation is greater among deficit than among income corporations, and that the industrial rankings of the two groups are somewhat different. Nevertheless, a significant degree of correlation is evident between the industrial rankings of income and deficit corporations, demonstrating that industrial differences in inventory turnover tend to persist despite shifts in the level of profitability.[8]

The fact that the ratio of inventory to sales for about two-thirds of the minor industrial divisions lies within the range of 10 to 25 percent suggests that under normal operating conditions the upper and lower limits to inventory holdings in relation to sales are fairly narrow. If a concern is to remain solvent, finished inventory may not constitute too great a proportion of sales. At the same time, a minimum amount of raw materials and goods-in-process is necessary to maintain effective operations. Of course, a sharp change in the volume of operations in one branch of industry may alter notably the relative position of the inventory/sales ratio of that group.

Factors that suggest themselves as the most likely determinants of industrial variations in the inventory/sales ratio are the length

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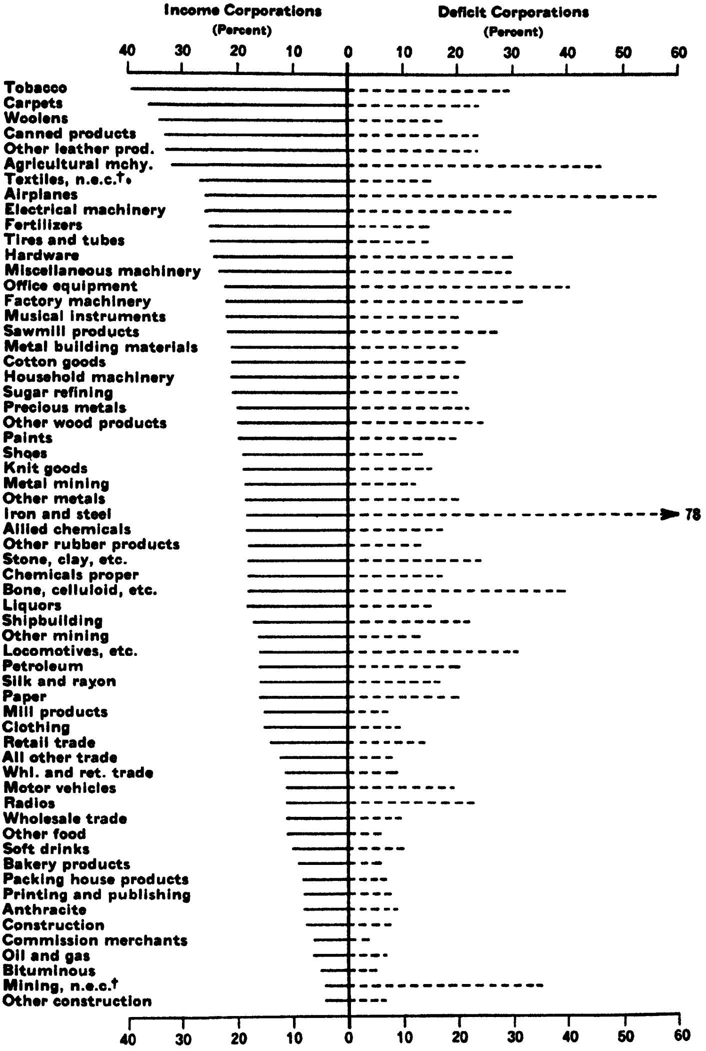
[8] This conclusion refers only to the relative position of industrial groups at a given time, and not to the level of inventory/sales ratios at different phases of business cycles. In 1931 the level of the inventory/sales ratios was generally higher than in 1937, but the range of variation among most industries was about as narrow as in the later year. Furthermore, most industrial groups retained the same ranking in the two years, indicating a high degree of stability of industrial differences.

Chart 1—Ratio of Average Inventory to Sales for Income and Deficit Groups of Minor Industrial Divisions, 1937*



*Based on data from *Source Book of Statistics of Income for 1937*. Average inventory is derived from beginning-of-year and year-end data for 1937. For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

and technical character of the production process, the perishability of the product, transportation facilities, marketing relationships both with the source of supply of raw and semifinished materials and with the agencies for distributing the finished product, and, finally, different seasonal patterns of operations. Such factors as speculative accumulation, managerial efficiency, accounting practices with respect to valuation, and changes in the price of raw materials probably do not play a significant part in determining industrial differences although they undoubtedly contribute to variations among corporations within an industry. In connection with industrial differences in inventory holdings, it is important to note that inventory may take three forms—raw materials, goods-in-process, and finished products—and that industrial variations may reflect differences in the types of inventory held.[3]

In certain lines of industry one factor apparently dominates the inventory turnover. For example, the fact that tobacco production has the highest ratio of inventory to sales of all minor divisions among income corporations probably is the result of the large volume of goods-in-process required by the long curing period, and of established marketing practices according to which the farmer disposes of all his crop to the producer who also possesses the curing facilities. The low turnover of inventory in certain branches of the machinery industry, notably electrical and agricultural machinery, also reflects the long production period, which requires a larger percentage of goods-in-process. In general, the more vertically integrated an industry is, the larger will be the proportion of its inventory-in-process to sales, other things being equal. The high ratio of inventory to sales in canning is probably related to the seasonal element in production, the balance-sheet date occurring when the season's pack has not yet been distributed to wholesalers. For carpet production, the low turnover may reflect the seasonal element in demand combined with a fairly regular

[3] Estimates based on the *Biennial Census of Manufactures: 1937* indicate that finished goods formed 44 percent of manufacturers' inventories, while "materials, supplies, fuel, work in process, and all other inventories" made up the remainder. If stocks in manufacturers' sales branches and mining inventories are included, the ratio of finished goods to total inventory is raised to 51 percent. (This latter estimate is taken from an unpublished memorandum by Mr. George Terborgh, formerly of the Board of Governors of the Federal Reserve System.) Undoubtedly this high percentage of finished goods inventory reflects the sharp recession at the end of 1937 which followed a large inventory boom.

rate of production, in contrast to the canning industry. This assumes that the date of the balance sheet refers to a seasonal low point in demand, while production continues at a rate only mildly affected by seasonal factors. Hardware products and precious metals have high inventory/sales ratios, probably reflecting a large inventory in finished products as well as raw materials and goods-in-process. Since in each of these last two cases the product is durable and short-run style changes are unimportant, large and diversified inventory of finished products may be held at small cost.

For several industries with low ratios of inventory to sales, specific explanations may also be offered. Low ratios in coal mining and in oil and gas production reflect the technical nature of the extractive process. No raw materials are essential, and stocks of goods-in-process are small in relation to sales, the length of the production process being negligible. Finally, finished stocks may be small owing to the passage of the coal and oil into the hands of separately incorporated distributors shortly after mining. In the case of oil production, the relative size of finished stocks varies as between the integrated and non-integrated companies. The low inventory/sales ratios in meat packing and baking are undoubtedly accounted for by the perishability of the product; both goods-in-process and finished inventories are relatively small. The low ratio for the construction industry reflects both the fact that construction is a service industry and the seasonal character of the industry. The balance sheet usually refers to the fiscal year-end, when the level of operations is low.

The small inventory holdings in relation to sales of the printing industry may be traced to the fact that finished inventory is negligible. Most printing work is done to order, the percentage of value added is very high, and raw materials are a minor part of the total cost. Since the production process is not long, the total effect is a very high turnover of inventory. Furthermore, printing is combined with publishing in the Internal Revenue data, and the rate of turnover in the latter is, of course, high.

Trade as a whole has a greater inventory turnover than the majority of manufacturing corporations, although many branches of manufacturing exceed trade. Wholesale trade, as might be expected, has a somewhat more rapid turnover than retail trade. Within the various branches of retail trade, the inventory/sales ratio shows a wide range of variation.[4] Eating and drinking places have the lowest ratio, while hardware dealers have the highest; the range between the two is as great as that between the first and third quartiles of the minor industrial divisions as a whole. In general, durability of the product appears to be the most significant factor determining differences in inventory turnover among the branches of retail trade.

The ratios of inventory to total assets for the industries studied (Chart 2) exhibit a greater range of variation than the inventory/sales ratios. The rankings of minor industrial divisions, however, are roughly the same according to the two ratios, particularly among income corporations, although there are several outstanding exceptions to this generalization. Wholesale and retail trade are the most important of the exceptions. These two groups have a relatively large investment of funds in inventory, but their exclusively merchandising function produces a low inventory/sales ratio.[5]

The relative size of certain balance-sheet accounts may be associated not only with specific minor industrial divisions but also with such general categories as producers' and consumers' goods.[6] When inventory holdings are examined in this light, we find that the average ratio of inventory to sales for industries manufacturing consumers' goods (which are on the whole more perishable and have a shorter period of processing than producers' goods) is significantly lower than the average ratio for producers' goods industries, the percentages being 16 and 22, respectively. On the other hand, with respect to the ratio of inventory to total assets, the difference between producers' goods and consumers' goods industries is small.

Can it be said that industries having large inventories tend to be those with small fixed capital assets? A comparison of these

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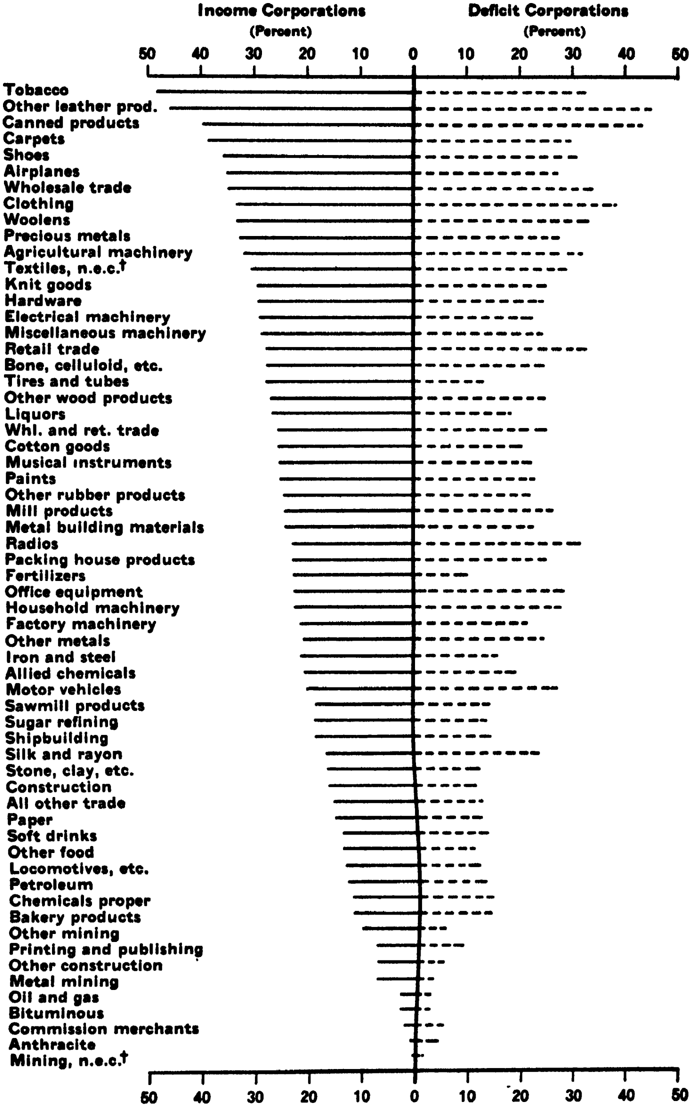
[4] See Table C-30 in Data Book. The information found there relates to 1938, the first year for which balance-sheet data on the separate branches of retail trade are available.

[5] See Appendix E for a list of the branches of retail trade. Among these branches, the variation in the inventory/sales ratio appears to depend largely upon the perishability of the product. This is also true of unincorporated business, according to data in the *Census Survey of Business: 1937-38* (U. S. Department of Commerce, Bureau of the Census).

[6] See Appendix E for the classification of minor industrial divisions into producers' and consumers' goods, which is employed throughout this study.

Chart 2—RATIO OF INVENTORY TO TOTAL ASSETS FOR INCOME AND DEFICIT GROUPS OF MINOR INDUSTRIAL DIVISIONS, 1937*



*Based on data from *Source Book of Statistics of Income for 1937*. For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

two balance-sheet components on the basis of sales reveals no significant rank correlation between the two accounts, direct or inverse, with respect to the minor industrial groups. Since inventory and capital assets account for more than half of total assets, an inverse correlation between the two items would be expected when they are compared with total assets, and such is the case. Even here, however, the correlation is far from perfect, although it is well above the level of statistical significance.

Differences among minor industrial divisions might possibly be related to differences in the average size of corporations and/or to differences in the average profitability of the divisions concerned. Analysis by the method of rank correlation, however, indicates that this is not the case with inventory, whether the comparison is made on the basis of total assets or sales.[7] As shall be seen in the following sections, inventory is related to corporate size and, to some extent, to profitability, but these factors are more important *within* than between industrial groups.

For each industry whose inventory ratios are given in Charts 1 and 2, only a composite figure is available. We do not know how typical each of the composite ratios may be, that is, how great is the dispersion of the ratios of individual corporations within each industry. Although such information for large corporations is given in *Statistics of American Listed Corporations*, published by the Securities and Exchange Commission, the data cover a cruder industrial classification, which divides manufacturing into sixteen groups; these groups approximate the major groups of the Internal Revenue data. A statistical test based on the SEC data reveals that the industrial differences between the average ratios of sales to inventory are significant despite considerable intra-industrial variation.[8] If this result is obtained for groups as broadly

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[7] See Appendix D for the rank correlation coefficients upon which this conclusion is based. A detailed discussion of interaction between size, industrial, and profitability classifications will be found in Appendix B, pp. 124-26.

[8] The SEC data are published in the conventional form of turnover ratios, with inventory in the denominator. Averages of the sales/inventory ratio (in times) are:

Food	12.1	Printing and publishing	16.1	Leather	6.3
Tobacco	2.6	Chemicals	5.6	Iron and steel	6.5
Beverages	14.1	Petroleum refining	7.7	Nonferrous metals	5.0
Textiles	5.4	Rubber	5.0	Machinery and tools	5.0
Lumber	4.0	Building materials	4.9	Transportation equipment	7.4
Paper	6.6				

(concluded on next page)

defined as those in the SEC study, it may confidently be assumed that industrial differences among the minor industrial divisions are also statistically significant, with the exception that this need not be true of particular industries whose mean ratios are very close to each other.

Examination of industrial rankings over short periods of time reveals a high degree of similarity between 1931 and 1937 in the rankings of the ratio of inventory to sales and the ratio of inventory to total assets. The stability of industrial rankings in inventory turnover arises from the fact that movements of sales and of inventory are so intimately connected that in a period of general expansion or contraction of business the various industrial divisions maintain the same relative position.

VARIATIONS WITH CORPORATE SIZE

The proportion of inventory to sales rises consistently and substantially as corporate size increases for most of the major manufacturing groups and for both income and deficit corporations (Chart 3). Stated in more conventional terms, inventory turnover tends to decrease as corporations grow in size. A few exceptions to the general pattern of behavior may be noted, however. The ratios for motor vehicles and for printing and publishing (particularly in the deficit division) do not follow the general tendency closely, although even in these cases the ratio rises fairly steadily for the first four or five size classes. Wholesale trade shows rather close conformity to the general pattern for manufacturing, but in retail trade the rate of inventory turnover varies remarkably little with size of corporation. Because the degree of variation with size differs among the several major industrial groups, the rankings of

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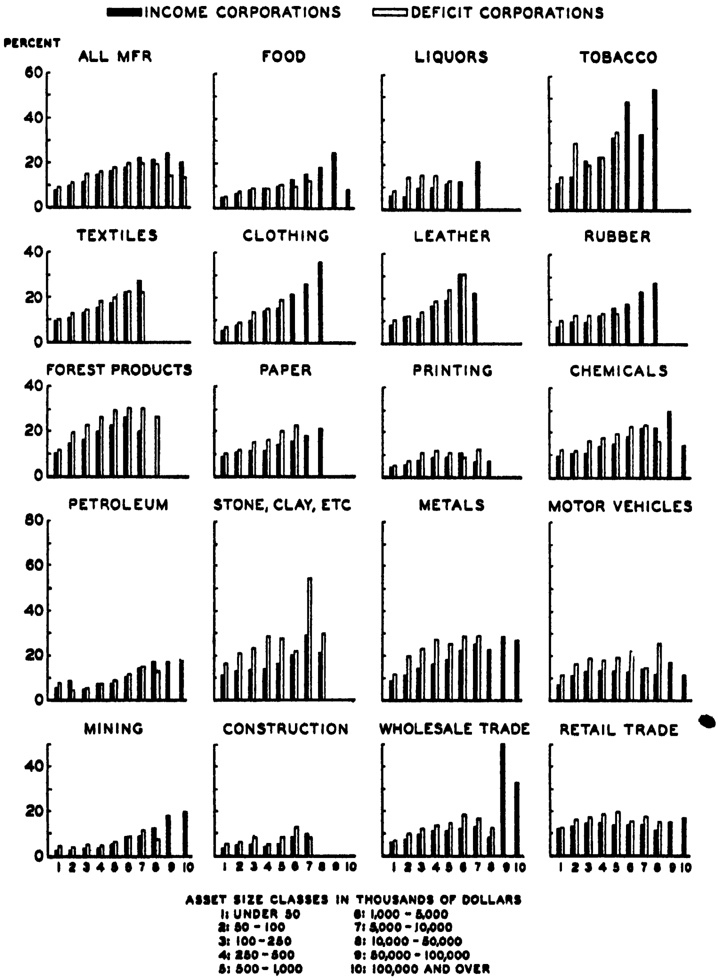
The frequency distribution of the sales/inventory ratio in manufacturing as a whole is as follows:

Ratio	*Frequency*	*Ratio*	*Frequency*	*Ratio*	*Frequency*
Under 1	5	5–5.9	107	10–14.9	84
1–1.9	51	6–6.9	83	15–19.9	35
2–2.9	131	7–7.9	63	20–29.9	37
3–3.9	182	8–8.9	38	30–39.9	12
4–4.9	141	9–9.9	38	40–49.9	2
				50 and over	6

Chart 3—RATIO OF AVERAGE INVENTORY TO SALES FOR INCOME AND DEFICIT GROUPS OF MAJOR INDUSTRIAL DIVISIONS, 1937, BY ASSET SIZE*



*Based on Table C-19 in Data Book (National Bureau of Economic Research). Wholesale and retail trade figures are for the year 1938.

industries in the largest size group are not at all similar to those in the smallest.[9]

A test based on the SEC data, which show the dispersion of the inventory/sales ratio *within* size classes, indicates that differences between the mean ratios of size classes are highly significant. The ratio of inventory to sales for listed corporations increases with size in the same manner as that for corporations as a whole.[10]

The persistent rise of the inventory/sales ratio, as corporate size increases, calls for an explanation, since on general grounds there is little reason to expect much variation in inventory turnover among corporations of different sizes. The turnover of raw materials and goods-in-process would appear to depend much more on industrial characteristics than on the size of concern. As for finished inventories, some writers have suggested that large corporations might be expected to hold a smaller volume of such inventories, in relation to sales, than small corporations, since the size of large concerns enables them to practice economies.[11] Our

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[9] Examination of the component minor industrial divisions within the major groups gives little indication that, on the whole, size variations can be attributed to the presence of concealed minor industries of different average asset sizes, although in liquor and beverages, rubber, and chemicals, some of the size variation may be due to the presence of such minor industries. Examination of the inventory/total assets ratio leads to the same conclusions. For a discussion of possible interaction between size and profitability classifications, see Appendix B, pp. 124-26.

[10] The variation of the inventory/sales ratio for the 1,034 listed manufacturing corporations is as follows:

Asset Class (millions)	*Aggregate Ratio of Inventory to Sales* (percent)	*Asset Class* (millions)	*Aggregate Ratio of Inventory to Sales* (percent)
Under $1	15.5	20— 50	23.5
1– 3	16.9	50—100	23.5
3– 5	19.8	100—200	26.2
5–10	20.9	200—500	23.1
10–20	23.2	500 and over	23.3

See Securities and Exchange Commission (Survey of American Listed Corporations), *Statistics of American Listed Corporations*, Part 1, pp. 226-45. The test of significance was made from the special tabulations by the Securities and Exchange Commission, described in Appendix A.

[11] See J. M. Clark, *The Economics of Overhead Costs* (Chicago, 1923). In discussing "How and Why Large Plants Bring Economy," Professor Clark notes that large-scale production consolidates risks. In a large concern "two or three customers with large orders will not make such a great impression on the total volume of business. Stocks of goods can be smaller compared with the volume of trade" (pp. 126-27). Similarly, in a discussion of merchandising, the suggestion is made that the economies of size apply to inventory holdings. "The large store spends a smaller percentage of its gross income for the goods it sells, but a larger percentage on operating expenses . . . while large stores turn their stock more rapidly . . . " (p. 343).

data, however, indicate just the opposite. Also the behavior of the inventory/sales ratio, which we have observed, does not conform to the expectation that high profitability and rapid inventory turnover are associated, since on the whole profitability exhibits little variation with size among income corporations, while among deficit corporations profitability varies directly with size.[12]

The most plausible theory to account for the observed variation is that vertical integration has an effect on inventory turnover, which increases as concerns grow in size. Actually, as far as the ratio of finished inventory to sales is concerned, vertical integration should have no particular effect one way or the other. But the raw materials and goods-in-process of a vertically integrated concern will form a higher percentage of its sales than comparable inventories of a less integrated corporation; that is, a corporation performing fewer operations and having a shorter period of processing. Since the ratio of inventory to sales rises even among the small corporations, it may be thought that vertical integration could not account for differences in the ratio between, say, a $50,000 and $250,000 corporation. However, even in this size range, integration may be an effective factor. The smallest concerns in manufacturing hold very small stocks of raw materials and are often engaged in performing only a single operation on a subcontracting basis. As the size of enterprise increases, even from total assets of $50,000 to $250,000, the complexity of the operations in most cases increases, which means relatively more goods-in-process, while the ability to finance holdings of raw materials likewise increases.[13]

If vertical integration is accepted as the basic explanation of the variation of the inventory/sales ratio with corporate size, the ratio cannot be employed (except in a very indirect way) as an index of the "efficiency" with which corporations of different sizes are utilizing their inventory holdings. Only if the ratio were to remain constant or decline with changes in size would it be possible to say that the effect of vertical integration had been clearly offset by economies in inventory utilization.

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[12] For the variation in the ratio of net income to net worth with corporate size, see Table C-25 in Data Book. The relationship between the inventory/sales ratio and profitability is discussed in detail in the next section.

[13] Nevertheless, one reason may be advanced to explain why integration should economize inventory holdings. Internal coordination of the production schedule should enable a concern to hold smaller quantities of raw materials and semifinished products than non-integrated concerns manufacturing a similar product. For a further discussion of integration in relation to financial structure, see Appendix B, p. 124.

Although the variation of the ratio of inventory to total assets is of less interest, it may be described here briefly. (See Table C-6 in Data Book for a tabulation of the ratio.) Medium-sized corporations, i.e., those with assets of $250,000 to $1,000,000, on the whole have the highest inventory/total assets ratios; and corporations with assets above $1,000,000 generally have ratios slightly lower than those of concerns under $250,000. The variation with size differs from industry to industry, however, and in some cases it is erratic. In retail trade, the variation is inverse with size, reflecting the fact that chain stores and large department stores, which are in the large asset-size classes, have a relatively greater investment in premises than have the small merchants. Several manufacturing groups also display a mildly inverse pattern. In some cases, the ratios of income and deficit corporations vary in different directions. Differences between size classes apparently are not dependent upon size itself but rather upon industry, profitability, or other characteristics correlated with size. A formal test of the variation of the ratio of inventory to total assets with size, based upon the SEC data, indicates no statistically significant differences between size classes of manufacturing corporations as a whole. This absence of substantial and systematic differences between large and small corporations in the ratio of inventory to total assets is of particular significance because, as we shall see in Chapter 4, it is not paralleled by similar behavior among the current liabilities.

Examination of the 1931 ratios for inventory/sales and inventory/total assets reveals results very similar to those described above. Evidently the relationship between inventory holdings and corporate size is an invariable feature of financial structure, at least over the period that we have covered.

VARIATIONS WITH PROFITABILITY

A relatively high turnover of inventory, particularly of inventory in the finished form, has frequently been taken by credit analysts and writers on business management as an index of successful operation. Therefore, income corporations would be expected to have a lower ratio of inventory to sales (a higher turnover) than deficit corporations in the same size and industrial classes. Efficient administration of inventory holdings in fact may be a *cause* of relatively high profitability, since the amount of short-term funds tied up in inventory is thereby reduced, and, therefore, costs are decreased to some extent. However, differences in inventory turnover would probably be confined mainly to inventory of finished goods. Deficit concerns, in the short run, may accumulate a large inventory of raw materials and goods-in-process relative to current shipments; but since movements in such inventories are presumably closely correlated with movements in shipments (though not so closely as finished goods and perhaps with a lag), there is little reason to expect much difference between income and deficit corporations in this type of inventory turnover.

The inventory data for 1937 do not conform systematically to the pattern suggested above. Income corporations for the majority of *minor* industrial divisions have a lower inventory turnover than deficit concerns in the same size classes. Examination of the ratios for *major* industrial divisions, shown on Chart 3, reveals the reason for this departure from expectations. For corporations with assets under $10,000,000 the turnover of inventory, on the whole, is higher in the income than in the corresponding deficit corporations, conforming to expectations. Among corporations with assets of over $10,000,000, however, the reverse is often true (e.g., mining, chemicals, and food). The fact that in 1937 the large corporations were almost entirely in the income group, together with the fact that the ratio of inventory to sales rises sharply as corporate size increases, is clearly the reason for the lower turnover in the income, compared with the deficit, corporations for most of the minor industrial divisions.

The 1931 data for inventory turnover provide a sharp contrast to the 1937 results. In the earlier year, the majority of both large and small concerns were in the deficit group, and the turnover of the deficit corporations was considerably lower than that of income concerns for all size classes.

The effect of fluctuations in the general level of business on the relative inventory turnover of income and deficit corporations may be seen in the following table:

RATIO OF INVENTORY TO SALES

Year	Manufacturing		Trade	
	Income	Deficit	Income	Deficit
1931	16.4%	26.6%	10.5%	17.9%
1932	17.7	30.0	11.6	18.3
1933	21.6	30.9	15.8	18.5
1934	19.2	25.6	13.5	15.7
1935	18.2	21.6	12.5	14.1
1936	18.6	19.6	13.0	12.7
1937	19.7	17.3	12.6	12.7
1938	20.1	22.6	12.7	14.1

Shifts of large corporations between the income and deficit groups were of great importance in producing the relative variations shown above. The data for 1937 also reflect the inventory boom of that year, followed by the rapid recession in sales in the last quarter. Apparently, the large corporations in the income group were over-optimistic in their anticipations and accumulated inventories that could not be rapidly liquidated. Deficit corporations in the large size classes, less optimistic in their outlook, appear to have followed a more hand-to-mouth policy with respect to inventories.

The level of the ratio of inventory to total assets is not significantly different for income and deficit corporations in 1937. For manufacturing as a whole the ratios are 20.6 and 20.2 percent for income and deficit corporations, respectively, while for trade the respective ratios are 28.1 and 29.0 percent. In the classification by size, inventory of the income corporations forms a slightly larger percentage of total assets than inventory of deficit corporations for all classes but the smallest and largest. (See Table C-6 in Data Book.) Like the inventory/sales data, these 1937 results differ from those for 1931. In 1931 the deficit corporations had a higher proportion of inventory to total assets, although the difference between the two years is not so great as in the case of the ratio of inventory to sales.[14]

A comparison of the inventory/sales ratio with the ratio of net income to net worth by the various size classes of the major industrial groups indicates that any direct relationship between inventory turnover and profitability—if it exists at all—is obscured by the effect of "size," which we have interpreted as reflecting the impact of vertical integration on the inventory/sales ratio. For income corporations, the high turnover among the small concerns is not associated with proportionately high profit rates. In the deficit group, the small concerns, which have substantially greater turnover ratios than the large, are much less profitable (make greater losses) than the large corporations.

Also, we have found no indication that the variation with size for the ratio of inventory to total assets is associated with differences in profitability among the size classes of the major industrial groups. The variation of the inventory/total assets ratio is much less systematic than the variation in profitability, and the tendency of the ratio to rise among the medium-sized concerns and then fall off among the large corporations is not related to the behavior of profitability.

Industrial differences in profitability are not reflected in inventory holdings. An analysis of the relationship between the ratio of inventory to sales and the rate of profitability of the minor industrial divisions reveals no significant relationship between the two ratios. A similar analysis of the ratio of inventory to total assets

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[14] The ratios of inventory to total assets for the years 1931-38 for the income and deficit groups of manufacturing and trade are as follows:

RATIO OF INVENTORY TO TOTAL ASSETS

Year	*Manufacturing*		*Trade*	
	Income	Deficit	Income	Deficit
1931	13.3%	14.6%	20.9%	23.3%
1932	12.6	12.3	22.3	21.0
1933	15.2	12.8	27.8	20.6
1934	17.5	13.8	26.7	22.3
1935	17.9	14.0	27.1	23.9
1936	18.9	16.7	28.3	25.4
1937	20.6	20.2	28.1	29.0
1938	18.6	18.6	25.2	28.7

also shows little relationship with industrial differences in profitability.[15]

Frequency distributions of the ratio of inventory to sales by profitability intervals are available for manufacturing as a whole in the SEC data. The dispersion of ratios within profitability classes is so great that no significant difference was evident among the average ratios of the six profitability groups tabulated. This finding indicates that industrial and other differences within profitability intervals are so great that differences in profitability are not sufficiently important to dominate other factors; but more refined data with narrower industrial classifications might show a different behavior.

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[15] See Appendix D for the rank correlation coefficients upon which these conclusions are based.

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CASH, MARKETABLE SECURITIES, AND RECEIVABLES

CASH AND MARKETABLE SECURITIES

FOR A CROSS-SECTION ANALYSIS of financial structure, cash and marketable securities may be considered under one general heading. In the administration of corporate finances marketable securities are usually regarded as the practical equivalent of cash; in fact, the phrase "cash and equivalent" is frequently applied to the two items.[1]

During recent years, the motives that induce corporations (and individuals) to hold cash and highly liquid securities have been classified in detail; the terms "liquidity," "transactions," and "speculative" motives have become a part of the conventional vocabulary of economics. Do the three motives operate so that holdings of cash and marketable securities are related systematically to the industry, size, and profitability of corporations? Since holdings of marketable securities have little reason to be closely related to the volume of current operations of an enterprise, we have directed our attention chiefly to ratios based on total assets.

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[1] An indication of the relative size of the cash and security holdings of nonfinancial corporations compared with those of the rest of the community may be useful. On or about December 31, 1937, all nonfinancial corporations held cash in till and deposits in bank (described here as "cash") amounting to $6,040,000 or 26 percent of the $23,370,000 of demand deposits outstanding (after adjustment for transit items). (See *Federal Reserve Bulletin*, May, 1940, pp. 401-3.) The cash holdings of unincorporated nonfinancial enterprises on the same date are estimated at $1,700,000. The total cash holdings of all business enterprises, incorporated and unincorporated and including financial concerns, amounted to 55 percent of total demand deposits. The time deposits held by business were negligible.

On or about December 31, 1937, marketable securities held by nonfinancial corporations amounted to $1,847,000, or about 4 percent of the outstanding tax-exempt obligations of federal, state, and local governments and their instrumentalities. The conventional definition of marketable securities is less precise than that employed by the Bureau of Internal Revenue. The Bureau of Internal Revenue, concerned with the administration of the corporation income tax, distinguishes two classes of corporate investments: government obligations and investments other than government obligations. The SEC data indicate, however, that what are called marketable securities in most balance sheets consist almost entirely of government obligations. The SEC's listed manufacturing corporations have a ratio of "marketable securities" to total assets of 2.8 percent, while the ratio of government securities to total assets for all large manufacturing corporations of equivalent size is 2.2 percent. Marketable securities are defined in *Regulation S-X Under the Securities Act of 1933 and the Securities Exchange Act of 1934* (Washington, 1940) as follows: "Include only securities having a ready market. Securities of affiliates should not be included here."

Industrial Variations

For most of the minor industrial divisions, the ratio of cash and equivalent to total assets fluctuates within a narrow range. The median value of the ratio is 8 percent; and the central half of the distribution lies within limits of 6 and 10 percent. (See Table C-28 in Data Book.) A moderate degree of industrial stability is indicated by the fairly similar rankings of income and deficit divisions, and also by the similarity of industrial rankings between 1937 and 1931. The ratio of cash and equivalent to sales likewise fluctuates within rather narrow limits. The central half of the distribution ranges between 5 and 10 percent, with a median value of 8 percent. (See Table C-28 in Data Book.)[2]

When cash and marketable securities are studied as separate items, the ratio of cash holdings to total assets for most minor industrial divisions also is found to move within a narrow range, with a median value of 6 percent. The ratio of marketable securities, on the other hand, shows less tendency to cluster about a central value. However, the proportion of marketable securities to total assets is so small in almost every case that the variations of this balance-sheet account are of little significance. In most industries, such investments rarely exceeded 3.5 percent of total assets in 1937;[3] and in that year they were commonly less than one-fifth of the volume of cash and equivalent combined. The situation in 1937 was strikingly different from that in 1931, when government securities formed a very important secondary reserve and the volume of holdings in many industries approximated that of cash, actually exceeding it in a few cases. The liquidation of such holdings during the depression considerably altered the relative importance of the two items.

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[2] The extremes of the ratio of cash and equivalent to sales (2 and 20 percent, excluding mining and quarrying for which the ratio is exceptionally high) are greater than the extremes for the ratio of cash and equivalent to total assets (3 and 17 percent).

[3] Exceptions are provided by silk and rayon (9.7 percent of total assets), chemicals proper (3.8 percent), allied chemicals (3.6 percent), factory machinery (4.6 percent), and hardware (4.9 percent). The percentages are characteristic of the income and not of the deficit corporations in these industries.

Data from *Statistics of American Listed Corporations* reveal a few extreme cases of a large proportion of marketable securities to total assets for certain more narrowly defined industrial groups. Among these cases are chewing gum and confectionary (18.7 percent), publishing of newspapers and periodicals (12.0 percent), chemicals and fertilizers (6.4 percent), industrial machinery (5.0 percent), and railroad equipment (5.0 percent).

When consideration is given to reasons for differences among industries in holdings of cash and marketable securities which may be of more than a random or unplanned character, attention is narrowed to what may be called the transactions motive; that is, the need to meet day-to-day requirements, the size of which may be more or less foreseen and may vary among industries because of differences in the frequency and regularity of receipts and disbursements. The data at our disposal do not make it possible to single out industrial differences in cash holdings which may be attributed to the transactions motive alone.[4] Nevertheless, the generalization seems warranted that all industries require a certain minimum of cash holdings, and that amounts above that minimum either are of a residual and random character or are the product of speculative and liquidity motives, not associated with industrial classifications. Also, cash holdings are subject to considerable seasonal fluctuations, which may partially account for some industrial differences.

The possibility remains that differences in holdings of cash and marketable securities among industries may be related to the average asset size and profitability of the minor industrial divisions. The data for minor divisions reveal that in the case of cash holdings industrial differences have an inverse, although only a very slightly inverse, relationship with differences in asset size. No significant relationship is found for marketable securities. A comparison of minor divisions on the basis of profitability indicates that the more profitable the industry the higher the proportion of cash and marketable securities, as a general rule. This tendency seems to be stronger with respect to securities than with cash.[5]

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[4] Perhaps a reflection of this factor is found in the relatively high ratios of cash to total assets for a number of branches of retail trade, which require sizable amounts of cash in till. (See Table C-30 in Data Book.)

[5] See Appendix D for the rank correlation coefficients on which these statements are based.

Table 3—DISTRIBUTION OF MARKETABLE SECURITIES FOR AMERICAN LISTED CORPORATIONS, 1937, BY KIND OF INDUSTRY AND BY INCOME AND DEFICIT DIVISIONS, AND FOR LISTED MANUFACTURING CORPORATIONS, BY ASSET SIZE[a]

Industry	*Percentage of Corporations with Marketable Securities*	*Ratio of Marketable Securities to Total Assets*
All corporations		
Income	38.1	2.62
Deficit	16.2	.48
Combined	33.7	2.48
Manufacturing		
Income	39.9	2.89
Deficit	12.7	.62
Combined	36.2	2.82
Extractive		
Income	33.9	5.64
Deficit	10.3	.35
Combined	21.9	3.66
Merchandising		
Income	32.2	1.88
Deficit	30.4	.65
Combined	32.0	1.79
Utilities		
Income	32.9	.36
Deficit	25.0	.02
Combined	32.4	.33
Listed Manufacturing Corporations		
Asset Size[b] (millions)		
Under $1	19.8	
1– 3	26.3	
3– 5	35.6	
5– 10	27.8	
10– 20	44.2	
20– 50	50.8	
50–100	47.9	
100–200	73.5	
200–500	66.7	
500 and over	100.0	

[a] Data, as of December 31, 1937, are from *Statistics of American Listed Corporations*, Part 1, Table 66, pp. 266-77 and pp. 224-45.

[b] Each size group is inclusive of the lower limit and exclusive of the upper.

Since marketable securities are an optional rather than an essential component of working capital, the frequency with which they appear in corporate balance sheets is of interest. Such information is not available in the compilations of the Bureau of Internal Revenue but it may be obtained for large listed corporations from the SEC data. Table 3 shows that one-third of all listed corporations and 36 percent of listed manufacturing corporations held marketable securities at the end of 1937. The frequency of such holdings among corporations earning a net income is, as would be expected, much higher than that of corresponding deficit corporations; and, also, it varies somewhat with corporate size, the large corporations having a higher frequency than the small. Although industrial differences in the ratio of marketable securities to total assets are noticeable among the four broad categories represented, the frequency does not vary greatly among these groups.

Variations with Corporate Size

The ratio of cash and marketable securities to total assets varies irregularly and narrowly as size of corporation increases. (See Table C-4 in Data Book.) The narrow range of variation among size classes recalls a similar slight variation among the minor industrial divisions. Since the behavior of cash differs from that of marketable securities, each item should be considered separately. The ratio of cash to total assets declines as size of corporation increases; the ratio for concerns in the smallest size class of manufacturing corporations is on the average about twice as great as the ratio for those in the largest. (See Table C-2 in Data Book.) For marketable securities the ratio is negligible among corporations with assets of less than $1,000,000; above that class it is roughly one-third to one-half the size of the cash to total assets ratio. (See Table C-3 in Data Book.) Clearly, the increase in the volume of marketable securities, as size of corporation becomes larger, compensates for the decline in the holdings of cash, so that the ratio of the two balance-sheet accounts combined shows only slight variations with size.

The downward movement of the ratio of cash to total assets as size of corporation increases appears to be in part a "passive" phenomenon, reflecting the greater importance of fixed capital, and particularly investments in affiliates among large, compared with small, concerns. An additional possibility is that large corporations can effect economies in their administration of cash by investing a higher proportion of their most liquid funds in marketable securities. Also, to the extent that they are more vertically integrated than small concerns, large corporations have relatively fewer cash payments to make to the outside economic world, which would permit some economy in cash holdings.

The higher proportions of marketable securities among the larger concerns reflect the fact that it is more economical to hold large amounts of marketable securities. The cost of acquisition and sale is not directly proportionate to the size of the holdings, being relatively greater for the smaller businesses. In the case of the deficit concerns, a further explanation for the higher ratio among large corporations is that the small units are in a much worse financial condition than the large.[6] These explanations are not comprehensive, however, for, as indicated above, the ratio of marketable securities to total assets does not rise consistently with corporate size; in fact, it tends to decline in the largest size class of most industrial groups.

The liquidation of marketable securities which occurred first in the depression period and later in the revival of 1933-37, when working capital requirements increased, caused substantial differences in the movement of the ratio of cash and equivalent to total assets in 1937, compared with 1931. In 1931 the security holdings of large corporations were so great that they dominated the movement of the ratio of cash and securities to total assets.[7] For income corporations this ratio tended to rise as size of corporation increased; and for deficit corporations the ratio fluctuated narrowly. The ratio of cash to total assets declined as corporate size increased, although this inverse movement was not so strong as in 1937. Between 1931 and 1937 the relative size of cash and security holdings in small corporations did not change much, primarily because the small corporations did not have the securities to liquidate. Among the larger corporations security holdings and cash were of almost equal importance in 1931, but by 1937 investments were relatively small.

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[6] For the variation with corporate size of the ratio of net income to average net worth see Table C-25 in Data Book. See also W. L. Crum, *Corporate Size and Earning Power* (Cambridge, Mass., 1939) Chapter 2.

[7] Some of the changes in the size variation of cash/total assets between 1931 and 1937 may have been the result of discontinuation of consolidated returns which had the effect (among the large corporations) of reducing, slightly, current assets as a percentage of total assets.

The ratio of cash and equivalent to sales characteristically rises among the larger corporations, resembling inventory in this respect. (See Table C-17 in Data Book.) Both components contribute to the upward tendency.[8]

Variations with Profitability

The ratio of cash and equivalent to total assets is uniformly higher among income than among deficit corporations. The same is true, with few exceptions, of the two components of the numerator of the ratio taken separately. Since this relationship holds for large as well as for small corporations, it is also observable in the classification by minor industrial divisions. In a number of cases, the deficit corporations of particular size classes have no marketable securities. The data for 1931 reveal similar features. A high degree of liquidity in the form of cash and security reserves is clearly associated with a high level of profitability. In the analysis of industrial differences above, we called attention to the tendency for relatively high ratios of cash and marketable securities to be associated with relatively profitable industrial divisions. However, differences in profitability among size groups within the major divisions are not associated with differences in cash or security holdings. For income corporations the ratios of net income to net worth and of cash and equivalent to total assets run somewhat parallel; among deficit concerns they move in opposite directions.

The cash and security holdings of income corporations are so much larger than those of deficit concerns that they have a lower turnover, while for most of the other asset items, the turnover either is higher in the income than in the deficit concerns or is not

[8] For *all manufacturing* the ratio of cash to sales varies as follows:

Asset Size (in thousands)	*Income*	*Deficit*	*Asset Size* (in thousands)	*Income*	*Deficit*
Under $50	3.7	2.6	$ 1,000– 5,000	5.4	3.7
50– 100	3.8	2.7	5,000– 10,000	6.7	3.6
100– 250	4.1	2.8	10,000– 50,000	7.2	4.5
250– 500	4.1	2.9	50,000–100,000	7.7	3.4
500–1,000	4.7	3.6	100,000 and over	6.6	2.3

substantially different. No doubt the relationship between cash and equivalent and sales reflects, to some extent, the seasonal fluctuations of working capital items. At the balance-sheet date, which probably represents a low point in the year's activity, cash would be greater relative to other current items than at other times of the year. The fact that the last quarter of 1937 was a period of rapid liquidation may also partially account for the high ratio of cash to sales among the income corporations.

RECEIVABLES

The ratio of receivables to sales (or its reciprocal) is widely used as an index of the extension of trade credit.[9] The volume of receivables outstanding at any time depends on both the volume of trade credit extended per dollar of sales and the length of time for which it is extended. The commonly used ratio for the "average collection period," $\frac{\text{Receivables}}{\text{Sales}} \times 365$, is only an approximation of the true collection period, since the receivables outstanding on the date of the balance sheet are not necessarily the average volume outstanding over the whole year to which the sales data refer. Apart from seasonal variations, the volume of receivables outstanding at any time also depends on the practice of selling accounts to obtain funds. Absence of quarterly data, however, requires that we use the cruder average.

Industrial Variations

Among industries, the ratio of receivables to sales (shown on Chart 4) varies widely. (See also Table C-28 in Data Book.) The median value for income and deficit corporations combined is 13 percent; the lower and upper extremes are 5 and 28 percent;[10] and the central half of the distribution ranges from 10 to 18 percent. Within the branches of retail trade, the range of receivables to sales is even wider, varying from a low of 1 percent for food stores to a high of 58 percent for furniture and house-furnishings

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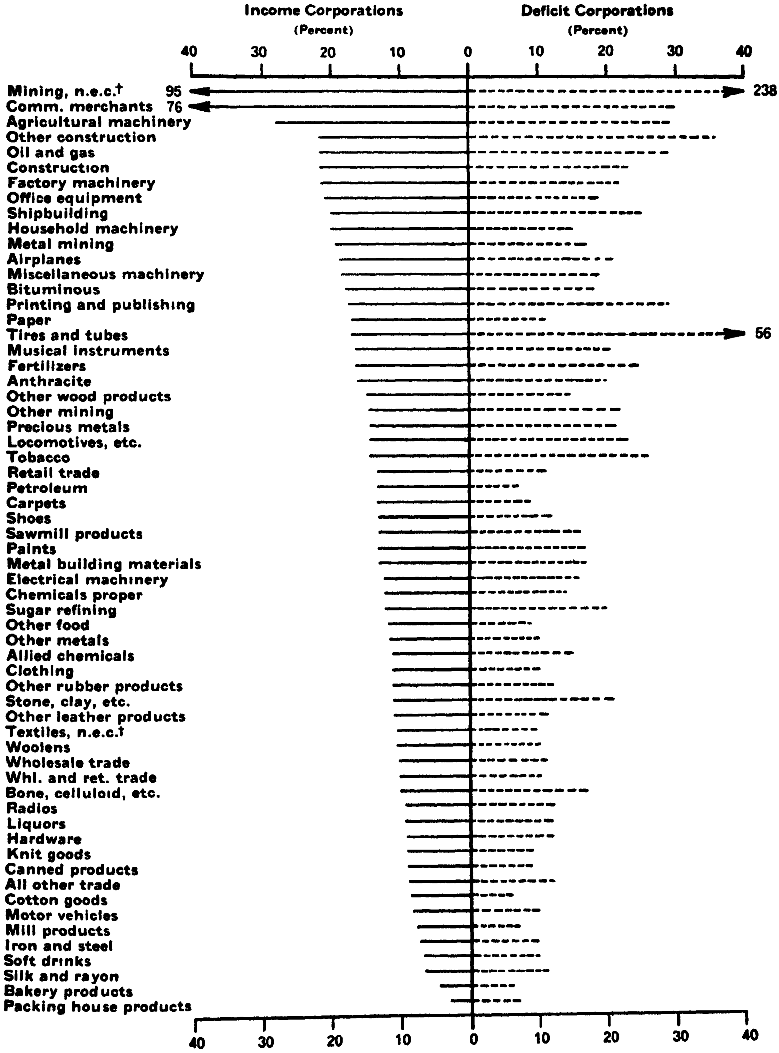
[9] A very small fraction of receivables consists not of trade credit but of stock subscriptions and loans to officers and employees. These may be ignored in the present discussion.

[10] Commision merchants and unclassified mining and quarrying corporations are excluded from this comparison; both have exceptionally high ratios.

Chart 4—RATIO OF ACCOUNTS RECEIVABLE TO SALES FOR INCOME AND DEFICIT GROUPS OF MINOR INDUSTRIAL DIVISIONS, 1937*



*Based on data from *Source Book of Statistics of Income for 1937.* For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

establishments for income corporations.[11] There is evidence of a strong degree of industrial stability in the rankings of the receivables/sales ratio. Practically the same rankings are found in 1931 as in 1937. Both income and deficit corporations in 1937 show a high degree of similarity in the industrial rankings, indicating that differences in the level of profitability do not upset industrial differences to a significant degree. The industrial rankings of the receivables/sales ratio are greatly different from the rankings of the ratio of receivables to total assets. In fact, the rank correlation between the two ratios is barely significant. Accordingly, explanations of industrial variations in the turnover of receivables will generally not apply to the ratio of receivables to total assets.

The heterogeneous industrial groups with small and large ratios of receivables to sales indicate that no one general factor may be singled out as a determinant of industrial variations in the turnover of receivables. Among the low ratios (high turnover) are bakery products, mill products, packing house products, soft drinks, silk and rayon, cotton goods, and iron and steel; among the high ratios (low turnover) are construction, oil and gas production, factory and agricultural machinery, shipbuilding, office equipment, and printing and publishing. Almost all the industries in which the factoring of receivables is extensively practiced are found in the lower range, including, e.g., knitted goods, cotton goods, and silk and rayon. That the average collection period will be short when the product concerned is relatively perishable is to be expected, and the ratios for such industries as baking, packing house products, and soft drinks seem to bear this out. Conversely, producers of relatively durable goods might be expected to extend a substantial volume of trade credit, except in those cases where arrangements have been made for the receivables to be financed by an outside credit agency such as a finance company.

When the ratio of receivables to sales is classified according to producers' and consumers' goods industries, a significant difference is found to exist between the average levels of the two groups. The producers' goods industries have an average ratio of 16 percent, compared with 12 percent for consumers' goods, showing that the former extend a larger proportionate volume of trade credit. The distinction between producers' and consumers' goods is not observable in the case of the ratio of receivables to total assets, however.

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[11] See Table C-30 in Data Book.

Another factor that may affect the receivables ratios of certain industries is the relationship between parent and subsidiary corporations. Since the present balance sheets are unconsolidated, the volume of receivables is comparatively high where the inter-affiliate debt is considerable.

Industrial differences in the ratio of receivables to sales were not found to be related to differences either in average asset size or in average profitability among the minor divisions.[12]

Variations with Corporate Size

Does the relative amount of trade credit extended become greater as size of corporation increases? We might expect that large concerns would be in a better position than small to finance their own credit sales. The data show a slight tendency for the ratio of receivables to sales to increase as corporate size rises,[13] a tendency which is more evident among income than among deficit corporations, the variation among the latter often being of an erratic nature. The behavior of this ratio is in decided contrast to the sharp and consistent rise of the inventory/sales ratio for both income and deficit divisions of the major industrial groups. The basic explanation of the difference between the turnover of inventory and receivables appears to be the fact that receivables are closely linked with sales and are therefore not affected by vertical integration, which, as we have seen above, is probably the main reason for the rise in the ratio of inventory to sales as corporate size increases.

Considered on the basis of total assets, the proportion of receivables actually declines with corporate size. (Table C-5 in Data Book.) As with receivables/sales, the movement is stronger and more systematic among income than among deficit corporations. For all manufacturing concerns, corporations with assets under $250,000 have about twice as much of their funds invested in receivables as concerns with assets over $5,000,000. Exceptions to this generalization are found, however, in liquor, construction, and wholesale and retail trade. The general and pronounced decline of receivables as a percentage of total assets may be explained as follows. Receivables parallel sales, and sales as a percentage of total assets decline as corporate size increases, because of both vertical integration and the increased importance of intercorporate investments among the larger corporations. Therefore, the ratio of receivables to total assets declines.

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[12] See Appendix D.

[13] See Table C-18 in Data Book.

Variations with Profitability

The difference in the amount of trade credit (as a percentage of sales) extended by income and deficit corporations is negligible in most cases. (Chart 4. See also Table C-18 in Data Book.) An actual count reveals that for the majority of the minor industrial divisions, deficit corporations are extending a slightly greater volume of trade credit in relation to their sales than the corresponding income corporations. That this represents an active policy is highly doubtful. More probably, the deficit corporations have greater difficulty collecting receivables and thus have, on balance, slightly higher ratios of receivables to sales. The data for 1931 reveal the same behavior, indicating that the relationship is not a product of the particular characteristics of the year end of 1937.

The ratio of receivables to total assets, when classified by asset size, shows that in general the proportion of funds invested in receivables is somewhat larger for income than for deficit corporations. (See Table C-5 in Data Book.) Numerous exceptions to this behavior occur, however, particularly among the large corporations. When the classification by industry rather than by asset size is considered, the ratio for income corporations differs little from that for deficit concerns. This follows from the fact that large corporations, among which the difference between the ratio of income corporations and that of deficit corporations is not very great, carry more weight than small concerns, among which the difference is quite pronounced. In contrast, classification of the 1931 data by either minor industrial divisions or asset size reveals a higher receivables/total assets ratio for income than for deficit corporations; in that year, the percentage of assets in the form of receivables was greater among income than among deficit corporations in large as well as in small asset-size classes.

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CURRENT LIABILITIES

NOTES PAYABLE

THE INFORMATION ON NOTES PAYABLE which appears in *Statistics of Income for 1937* is of particular interest to both students of banking and students of financial structure, for it provides data on notes payable distributed by industry, size, and profitability.[1] For each of these classifications, we can obtain the dollar volume of notes payable, and we can also measure their importance in relation to other liabilities and assets as well as to sales. It is impossible to obtain such comprehensive data from available banking statistics, although a survey of new commercial loans and renewals during the period April 15-May 15, 1942, made by the Board of Governors of the Federal Reserve System, has helped to fill in this statistical gap.

The 1937 classification of current liabilities, which separates notes payable from accounts payable, provides for an item described as "bonds, notes, and mortgages payable (with original maturity of less than 1 year)."[2] Since bonds and mortgages with original maturity of less than one year are very rare, this item may be considered entirely as notes payable. However, it may include not only notes payable to banks but also notes payable to other financial institutions, to trade creditors, and, among small corporations, to officers, directors, and other individuals. Except in the case of the smallest corporations, with assets of less than $100,000, a safe assumption seems to be that notes payable are due primarily to commercial banks.[3] On the other hand, notes payable exclude certain forms of corporate indebtedness to banks, particularly term loans, which are repayable in whole or in part after the lapse of more than one year, and thus underestimate the volume of corporate indebtedness to banks. Term loans, a fairly recent development in banking practice, are likely to be classified with "bonds, notes, and mortgages payable (with original maturity of 1 year or more)," the basis being original, not current, maturity.[4] In the following discussion bonds, notes, and mortgages payable with original maturity of less than one year will be referred to as "notes payable."

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[1] Although notes payable were classified separately by the Bureau of Internal Revenue from 1924 to 1927 inclusive, they were not presented in the threefold classification given for 1937. From 1928 to 1936 inclusive, they were combined with accounts payable.

[2] See the facsimile of Corporation Income and Excess-Profits Tax Return (Form 1120), given in *Statistics of Income for 1937*, Part 2, p. 236.

[3] Although the Internal Revenue data shed no light on the types of notes payable, a sample of balance sheets of 745 large manufacturing corporations for 1938 and 1939, collected by the Federal Trade Commission, provides some information on the

Industrial Variations

On or about December 31, 1937 the notes payable of all corporations totaled $10,400,000,000, or 47 percent of the total loans of all banks. Of this total, $6,700,000,000, or 30 percent of all bank loans, represented the short-term borrowings of nonfinancial enterprises.[5]

Distribution of the total volume of notes payable among the various industrial divisions is presented in Table 4. Borrowings of financial corporations, including real estate and personal finance, represented 36 percent of the total—the largest for any one industrial division. Manufacturing accounted for 25 percent, trade

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volume of notes payable due to banks in comparison with those due to trade creditors. Ninety-four percent of all notes payable are due to banks. Notes payable to trade creditors, which occurred in 35 industries of a total of 73, represented only 0.1 percent of the total assets for all corporations in the sample and only 6 percent of the total volume of notes payable. See Industrial Corporation Reports, Federal Trade Commission, 1941. These reports are in the form of aggregate balance sheet and income statements for narrowly defined industrial groups.

[4] Term loans outstanding as of December 31, 1937 were estimated at $827,000,000 on the basis of a sample study made by the Financial Research Program. More than half of these loans were made to corporations with assets over $50,000,000, and nearly 96 percent to borrowers with assets over $1,000,000. Industrially, nearly 60 percent of bank term loans has gone to mining and extraction (including oil production), public utility, and financing concerns, and only 30 percent to manufacturing concerns of all kinds.

[5] The notes payable of unincorporated enterprises (retail trade for the most part) cannot be measured directly but may be estimated by using data on the relative volume of sales of incorporated and unincorporated enterprises as given in the *Census of Manufactures* and the *Census of Distribution.* On this basis, there were $2,600,000,000 of notes payable in unincorporated enterprises in 1937. An attempt was made to obtain an estimate by deducting total notes payable of corporations from Federal Reserve Board statistics giving the total volume of "commercial loans" outstanding, but the latter are apparently defined too narrowly to permit such a method of estimating.

Table 4—DISTRIBUTION OF NOTES PAYABLE FOR INCOME AND DEFICIT CORPORATIONS COMBINED, 1937, BY INDUSTRIAL DIVISIONS[a]
(in millions)

Industrial Division	*Notes Payable*
ALL MANUFACTURING	*$2,593*
Food and Kindred Products	*381*
Bakery products	54
Canned products	129
Mill products	34
Packing house products	52
Sugar refining	33
Other food	79
Liquors and Beverages	*131*
Soft drinks	10
Liquors	121
Tobacco Products	*62*
Textile Mill Products	*248*
Cotton goods	66
Woolens and worsteds	28
Silk and rayon	19
Carpets	20
Textiles, not elsewhere classified	83
Knit goods	32
Clothing and Apparel	*93*
Leather and Manufacturing	*81*
Boots, shoes	35
Other leather products	46
Rubber Products	*54*
Tires and tubes	41
Other rubber products	11
Bone, celluloid, etc.	2
Forest Products	*140*
Sawmill products	80
Other wood products	60
Paper, Pulp, and Products	*$ 76*
Printing and Publishing	*120*
Chemicals and Allied Products	*178*
Chemicals proper	40
Paints, varnishes	20
Allied chemicals	109
Fertilizers	9
Petroleum and Other Oil Products	*203*
Stone, Clay, Glass	*62*
Metals and Products	*641*
Household machinery	24
Iron and steel	175
Locs. and r.r. equipment	11
Factory machinery	35
Agricultural machinery	29
Electrical machinery	63
Miscellaneous machinery	78
Office equipment	13
Metal building materials	54
Hardware	49
Precious metals	19
Other metals	91
Motor Vehicles	*38*
Other Manufacturing	*85*
Radios	10
Musical instruments	62
Airplanes	13

(concluded on next page)

for 16 percent, and transportation and public utilities for 11 percent. Among the manufacturing corporations the largest borrowers were the metals, foods, petroleum and other oil products, and textiles groups.

Since the chief use of bank loans is to aid in increasing the rate of industrial activity, the distribution of notes payable on any particular date reflects not only the cyclical fluctuations of differ-

Table 4 (concluded)—Distribution of Notes Payable for Income and Deficit Corporations Combined, 1937, by Industrial Divisions[a]
(in millions)

Industrial Division	*Notes Payable*
Shipbuilding	$ *8*
Construction	*131*
Building and construction above ground	51
Other construction	80
Mining and Quarrying	*386*
Metal mining	46
Anthracite	35
Bituminous coal	60
Oil and gas	180
Other mining	22
Mining and quarrying, not elsewhere classified	43
Trade	*1,672*
Wholesale	681
Retail	541
Wholesale and retail	331
Commission merchants	86
All other trade	33
Transportation and Public Utilities	*1,104*
Steam railroads	293
Electric railways	121
Water transportation	47
Aerial transportation	5
Autobus lines	$ 21
Cartage and storage	64
Electric light	218
Gas	188
Pipe-line	37
Telephone and telegraph	43
Broadcasting	5
Water	32
Terminals, etc.	30
Service	*609*
Domestic service	441
Theaters	3
Motion picture prod.	23
Motion picture theaters	33
Other amusements	22
Professional service	53
Business service	16
Other services	18
Finance, Including Banks	*3,713*
Agriculture	*145*
Nature of Business Not Given	*12*
Grand Total	*$10,373*

[a] Based on data, as of December 31, 1937, from *Source Book of Statistics of Income for 1937* and *Statistics of Income for 1937*, Part 2.

ent branches of industry but also seasonal characteristics and other dynamic factors.[7] It is regrettable that no comparable data on notes payable are available prior to 1937 to enable us to appraise adequately the extent to which the particular characteristics of cyclical fluctuations in the various branches of the economy affect the distribution of bank loans. Another serious limitation of the available data is that the figures cannot be adjusted for seasonal fluctuations in borrowing. The borrowings outstanding on the balance-sheet date are probably lower than the annual average in most cases, but lack of comprehensive monthly or quarterly data prevents an appraisal of the extent to which apparent industrial differences reflect different seasonal patterns.[6]

The outstanding feature of the differences among industries in the turnover of notes payable is the narrow absolute range within which the ratios for the majority of minor industrial divisions fall (Chart 5). In most cases, notes payable are less than 5 percent of sales; and the range between the first and third quartiles is only 1.8 percentage points for income and deficit concerns combined.

Industrial variations in the degree of utilization of short-term credit are even more difficult to "explain" than are industrial variations in the turnover of inventory and receivables. The ratios for minor industries within such major industrial groups as food, textiles, chemicals, and metals do not tend to cluster together; and no general relationship is apparent between the characteristic features of the industrial divisions and their reliance upon bank borrowing. The ratio for total manufacturing differs little from that of trade as a whole, but within the divisions of both manufacturing and retail trade there are wide variations. The turnover in retail trade is about twice as rapid as in wholesale trade. The fact that the correlation of the rankings of income and deficit corporations of the minor industrial divisions is very low suggests that the shift from an income to a deficit classification is sufficiently strong to override any "industrial" differences. Further analysis reveals that the industrial rank according to this ratio is related neither to the average asset size nor to the profitability of the minor industrial divisions. Also, classification into producers' and consumers' goods industries does not reveal significant differences in the average value of the notes payable/sales ratio.

In several respects the behavior of the ratio of notes payable to total assets contrasts with that of notes payable to sales. In the former case, the ranking of income and deficit corporations in the minor industrial divisions is moderately similar, indicating that even with substantial differences in the level of profitability, the importance of notes payable relative to the other liabilities remains approximately the same. Comparison of the average ratio of notes payable to total assets for consumers' and for producers'

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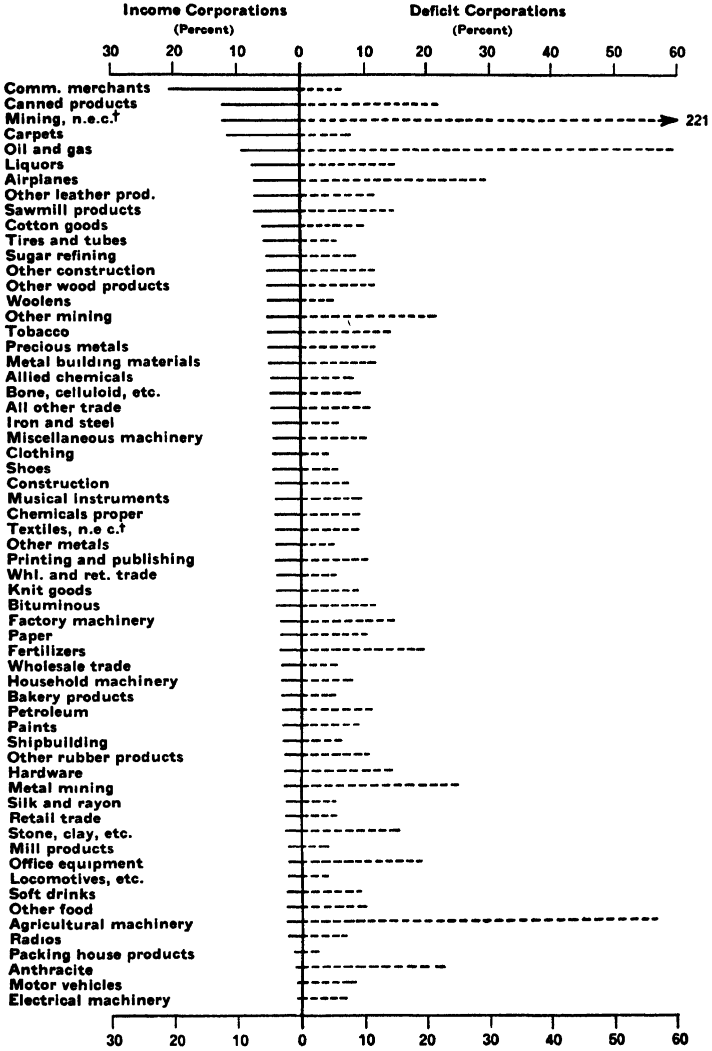
[6] While the monthly series of commercial loans for reporting member banks, compiled by the Board of Governors of the Federal Reserve System, shows no pronounced seasonal variation, it must be appreciated that the series reflects the combination of many industries, some of which have a definite seasonal pattern.

Chart 5—Ratio of Notes Payable to Sales for Income and Deficit Groups of Minor Industrial Divisions, 1937*



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*Based on data from *Source Book of Statistics of Income for 1937.* For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

goods industries reveals a significant difference between the two groups: the ratio for consumers' goods industries is considerably higher than that for producers' goods. Finally, the less profitable industries and those of relatively small average asset size seem to have a fairly high proportion of notes payable, indicating that "industrial" characteristics alone do not account for differences in the ratio among the minor industrial divisions.

Since data for notes payable are not available prior to 1937, a comparison of the stability of the industrial rankings between 1937 and 1931 is impossible. A comparison may be made, however, for notes and accounts payable combined, as a percentage both of assets and of sales. In each case the 1931 industrial rankings are strongly similar to the 1937 rankings. Unless the movements of notes payable compensated for those of accounts payable during this period, or vice versa, a reasonable conclusion is that industrial differences in the two components are stable over short periods of time.

The suggestion has often been made that variations in inventory holdings may provide a key to the explanation of industrial variations in notes payable. The validity of this hypothesis depends upon whether sales or total assets are taken as the basis of comparison. The correlation of the industrial rankings of the notes payable/sales ratio with the inventory/sales ratio is below the level of statistical significance. On the other hand, a moderate degree of correlation is evident between the rankings of the ratio of notes payable to total assets and the inventory/total assets ratio. In other words, industries with relatively large (or small) investments in inventory tend to derive a relatively large (or small) proportion of their current funds from banks, although the turnover of inventory and that of notes payable are not significantly related.

Because of the small proportion which notes payable form of sales and total assets, the relative variations of notes payable both to sales and to total assets are as large as those of other working capital components. The smallness of the absolute variations, however, suggests that industrial differences in bank borrowings, while important from the point of view of the lender's opportunity, may not reflect a significant change in borrowing policy from the point of view of an individual corporation or of an industry as a whole.

Variations with Corporate Size

"Small business," with assets under $250,000, accounts for 22.3 percent of short-term indebtedness in the form of notes payable among nonfinancial corporations (Table 5); corporations with assets of between $250,000 and $5,000,000 account for 38.4 percent; and "big business," corporations with assets of $5,000,000 and over, for 39.3 percent. Thus a little more than 60 percent of the total volume of notes payable represents the indebtedness of small and medium-sized corporations, although in this group is included only 30 percent of the total assets and 53 percent of the total sales of all nonfinancial corporations.

Table 5—DOLLAR VOLUME AND PERCENTAGE DISTRIBUTION OF NOTES PAYABLE FOR NONFINANCIAL CORPORATIONS, 1937, BY ASSET SIZE[a]
(dollar figures in thousands)

Size[b]	*Income Corporations*	*Deficit Corporations*	*All Corporations*	
			Volume	Percentage Distribution
Under $50	$128,601	$313,782	$442,383	6.6
50–100	167,383	207,269	374,652	5.6
100–250	338,925	332,240	671,165	10.1
250–500	318,837	264,526	583,363	8.8
500–1,000	323,141	285,610	608,751	9.1
1,000–5,000	816,081	546,986	1,363,067	20.5
5,000–10,000	291,703	217,786	509,489	7.7
10,000–50,000	627,854	292,550	920,404	13.8
50,000–100,000	216,980	116,825	333,805	5.0
100,000 and over	533,959	318,418	852,377	12.8
TOTAL	$3,763,464	$2,895,992	$6,659,456	100.0

[a] Based on data, as of December 31, 1937, from *Statistics of Income for 1937*, Part 2.

[b] Inclusive of the lower limit and exclusive of the upper.

Variations in notes payable among corporations of contrasting size differ sharply according to the basis of comparison. In general, variations in the ratio of notes payable to total assets present a more systematic and more easily explained pattern than variations in the ratio of notes payable to sales.

Notes payable as a percentage of sales vary with corporate size in a predominantly erratic way. (See Table C-21 in Data Book.) Furthermore, little similarity is evident between the variation of the ratios for income and deficit corporations in the same major industrial division. Despite the numerous reversals of direction in the movements of the ratios, however, the ratios for large corporations, with assets over $5,000,000, in a number of groups are at approximately the same levels as those for small corporations, with assets less than $250,000. Medium-sized corporations, with assets between $250,000 and $5,000,000, tend to have higher ratios than either large or small concerns. This general pattern is found in manufacturing as a whole and also in trade. When considered in conjunction with the systematic variations with corporate size of the ratios of receivables and of inventory to sales, it throws some light on the interrelationships of these working capital components. Current liabilities have customarily been considered as bearing a fairly close relationship to current assets, although the nature of this relationship and its basis have seldom been stated precisely. On the basis of ratios to sales, the data studied here indicate that the relatively substantial volume of inventory holdings and receivables of the large corporations are not financed by a proportionately high volume of notes payable, but are supported primarily by funds represented by net worth.[7] The absence of a close parallel between the variations of notes payable as a percentage of sales and the current assets to which they are hypothetically related also reflects the fact that the volume of short-term borrowings is subject to the somewhat arbitrary decisions of the firms making up the size groups in each industry. Only in short periods of relatively rapid change in the working capital assets (associated with seasonal and cyclical fluctuations) is there likely to be a close relationship between changes in notes payable and changes in the current assets.

The ratio of notes payable to total assets follows a more systematic pattern than the notes payable/sales ratio, although even in this form notes payable show more erratic tendencies than the

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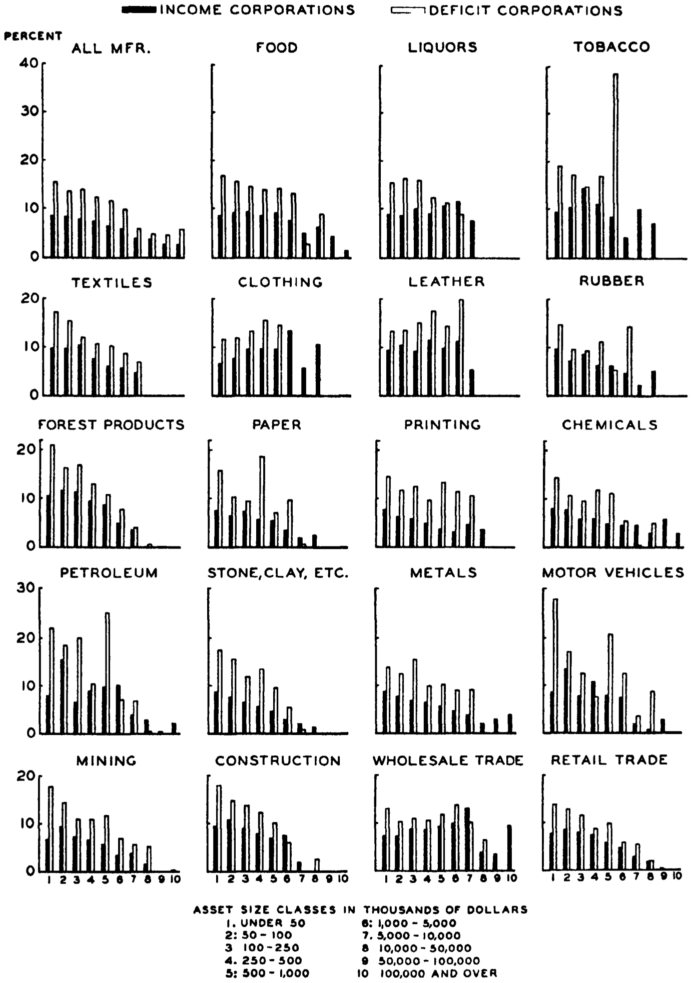
[7] Two qualifications to this statement are in order. First, the matching of "sources" of funds with "uses" is largely upon a formal plane, and does not necessarily imply that specific sources of funds are devoted to the acquisition of certain assets or the reduction of certain liabilities. Second, the above conclusion is based upon a static, cross-section analysis and does not deny that *changes* in working capital accounts may be intimately related.

Chart 6—RATIO OF NOTES PAYABLE TO TOTAL ASSETS FOR INCOME AND DEFICIT GROUPS OF MAJOR INDUSTRIAL DIVISIONS, 1937, BY ASSET SIZE*



*Based on Table C-19 in Data Book (National Bureau of Economic Research). Wholesale and retail trade figures are for the year 1938.

other major working capital components (Chart 6). The preponderant tendency is for the notes payable/total assets ratio to decline as size of corporation increases, although in very few of the major industrial groups is this behavior consistent from size class to size class, and in several cases it is not found at all.[8] The movements of the ratio often differ as between income and deficit concerns, and the range of variation is usually larger among the deficit concerns. The downward movement among the large-sized corporations in the proportion of notes payable to total assets indicates that the larger corporations take advantage of their greater access to long-term investment markets and of the reinvestment of earnings as a source of funds.

Variations with Profitability

Of the $6,700,000,000 of notes payable outstanding in the balance sheets of nonfinancial corporations at the end of 1937, $3,800,000,000 were payable by income and $2,900,000,000 by deficit concerns. When considered as a proportion of total assets or of sales, however, notes payable are substantially smaller among income than among corresponding deficit corporations. (See Charts 5 and 6.) Profitable concerns, finding alternative sources of financing more readily available, take advantage of such opportunities to reduce their short-term indebtedness. Considerations of relative cost and of convenience combine to produce this result, once the necessary condition—availability of alternative sources of funds—is present. This does not deny that in short-period variations of the level of business the more profitable concerns may finance their incremental working capital requirements by short-term borrowing to a greater extent than the deficit concerns. But the average level of their borrowings tends to be lower.

A comparison of industrial variations in notes payable ratios with industrial differences in profitability shows that generally the profitability differences are not sufficient to dominate the industrial character of short-term borrowings. An exception is found in the ratio of notes payable to total assets among deficit concerns in which there is an inverse relationship between the proportion of notes payable and the level of profitability. This appears to reflect not so much an active policy with respect to short-term borrowing, but rather the "passive" effect of variations in the major liability component, net worth, which are extreme in the case of minor industrial divisions in the deficit category. The net worth of the less profitable divisions in the deficit group is so shrunken that the notes payable are, in proportion, greatly enlarged.

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[8] The variation is particularly erratic in liquors and beverages, tobacco, clothing, and leather. This is partially due to the presence within the major groups of concealed minor industrial divisions of varying asset sizes.

Size variations in the ratio of notes payable to total assets are not found to be related to profitability. Among size classes no sign of relationship is evident between the movements of the ratio of notes payable to sales and those of net income to net worth. While the notes payable/total assets ratio shows systematic variations with size that are similar in the income and deficit divisions, the variations in profitability are distinctly different in the two groups.

Borrowing and Nonborrowing Corporations

The Internal Revenue data do not permit a classification of corporations according to whether or not they have notes payable in their balance sheets. When comparing one class of corporations with another, it is impossible to tell, for example, whether a comparatively low ratio of notes payable to total assets is the result of a small percentage of notes payable among all the firms in that group, of a small percentage of borrowing concerns, or of both. For corporations with assets of more than $1,000,000, some light is thrown on this question by data in *Statistics of American Listed Corporations*. The number of firms with notes payable in their balance sheets is probably lowest on or about the date to which the balance sheets refer, since that date very likely marks the seasonal low point for borrowings. Table 6 reveals that differences in the relative frequency of notes payable among the major divisions of manufacturing and several other broad industrial groups are not, in most cases, widely dispersed about the average frequency for all corporations as a whole, which is 42 percent.

The relative frequency of notes payable shows no systematic variation with corporate size, except in the case of merchandising concerns, which exhibit some tendency toward an inverse variation

Table 6—RELATIVE FREQUENCY OF NOTES PAYABLE FOR LISTED CORPORATIONS, 1937, BY INDUSTRIAL GROUPS[a] (in percent)

Industry	*Frequency*
All corporations	42.1
All manufacturing	43.7
Food	45.5
Tobacco	52.4
Beverages	53.6
Textiles	49.2
Lumber	75.0
Paper	44.4
Printing and publishing	37.5
Chemicals	38.7
Petroleum refining	47.4
Rubber	52.9
Leather	61.1
Building materials	30.9
Iron and steel	38.0
Nonferrous metals	47.2
Machinery and tools	41.1
Transportation equipment	46.0
Merchandising	45.0
Chain stores	36.1
Department stores	42.1
Extractive	30.4
Utilities	54.0

[a] Based on data, as of December 31, 1937, from *Statistics of American Listed Corporations,* Part 1, Table 63, p. 212.

(upper half of Table 7). In marked contrast to the behavior with respect to size, a strong inverse relationship is seen between the frequency of borrowing and profitability (lower half of Table 7). This inverse relationship is a particularly interesting parallel to that of the ratios of notes payable to total assets and to sales, which are greater among deficit than among income corporations.

ACCOUNTS PAYABLE

In the preceding chapter we considered variations among different classes of corporations with respect to the extension of trade credit. Here we are concerned with the distribution of trade credit from the point of view of the recipient. There is not perfect correspondence between the accounts receivable and the accounts pay-

Table 7—RELATIVE FREQUENCY OF NOTES PAYABLE FOR MAJOR INDUSTRIAL GROUPS OF LISTED CORPORATIONS, 1937, BY ASSET SIZE AND BY PROFITABILITY[a]
(in percent)

Total Assets[b] (in millions)	*Frequency*			
	Manufacturing	Merchandising	Extractive	Utilities
	SIZE			
Under $1	48.3	73.7	30.1	...
1- 3	43.1	43 3	41.9	.0
3- 5	44.7	51.6	20.0	...
5- 10	51.5	48.4	15.4	50.0
10- 20	37.2	38.5	22.7	37.5
20- 50	36.7	38.9	43.8	25.0
50-100	37.5	10.0	33.3	50.0
100-200	50.0	.0	100.0	50.0
200-500	42.9	.0	...	100.0
500 and over	40.0	...	...	72.2
	PROFITABILITY			
Net Profit or Loss on Invested Capital[b] (in percent)				
Net Loss				
10 and over	65.5	100.0	48.1	...
5-10	84.6	100.0	33.3	...
2- 5	50.0	80.0	41.7	...
0- 2	57.7	37.5	33.3	...
Net Profit				
0- 2	54.3	50.0	20.0	...
2- 5	53.1	61.1	37.0	64.0
5-10	42.1	42.6	23.1	46.7
10-20	44.8	37.3	9.1	75.0
20 and over	29.2	31.6	22.7	...

[a] Based on data, as of December 31, 1937, from *Statistics of American Listed Corporations*, Part 1, Tables 64 and 65, p. 224.

[b] Inclusive of the lower limit and exclusive of the upper.

able of all nonfinancial corporations, since the group as a whole is a net creditor in this respect.[f] At the end of 1937, nonfinancial corporations had outstanding $15,600,000,000 of receivables and $12,100,000,000 of accounts payable, showing that they were extending $3,500,000,000 of trade credit to the noncorporate economy, most of it, presumably, in the form of trade credit to unincorporated retailers.

As in the case of receivables, the volume of accounts payable outstanding at any time depends on the proportion of sales which are financed by trade credit and the average length of time for which that credit is extended. A change in either factor will affect the proportion of accounts payable; therefore, data on the turnover of payables must be interpreted with this fact in mind.

Industrial Variations

The range of variation among industries for the ratio of accounts payable to sales closely resembles that of the ratio of receivables to sales. (Compare Charts 4 and 7.) For income and deficit corporations combined, the lower and upper extremes of the accounts payable/sales ratio are 3 and 23 percent, respectively; the central half of the distribution lies between 6 and 11 percent; and the median value is 8 percent.[9] (See Table C-28 in Data Book.) In most branches of industry, accounts payable are a more important source of short-term credit than notes payable. The relative importance of the two items varies from industry to industry, with the difference being particularly strong in wholesale and retail trade, where accounts payable are about twice as large as notes payable in relation to sales.[10]

The heaviest users of trade credit in relation to volume of sales include commission merchants and the clothing, mining and quarrying, construction, airplane production, printing and publishing, and iron and steel industries. At the other end of the scale are such industries as mill products, packing house products, tobacco, boots and shoes, knit goods, office equipment, and hardware. Among the possible general explanations of the varying degree to which trade credit is used, the length of the processing period is the most probable, although it clearly cannot account for the high ratios of commission merchants and the clothing industry. The longer the processing period, the more likely is an industry to depend upon credit from the suppliers of its raw and semi-finished materials. The degree of reliance upon such financing should also be greater among non-integrated than among integrated enterprises.

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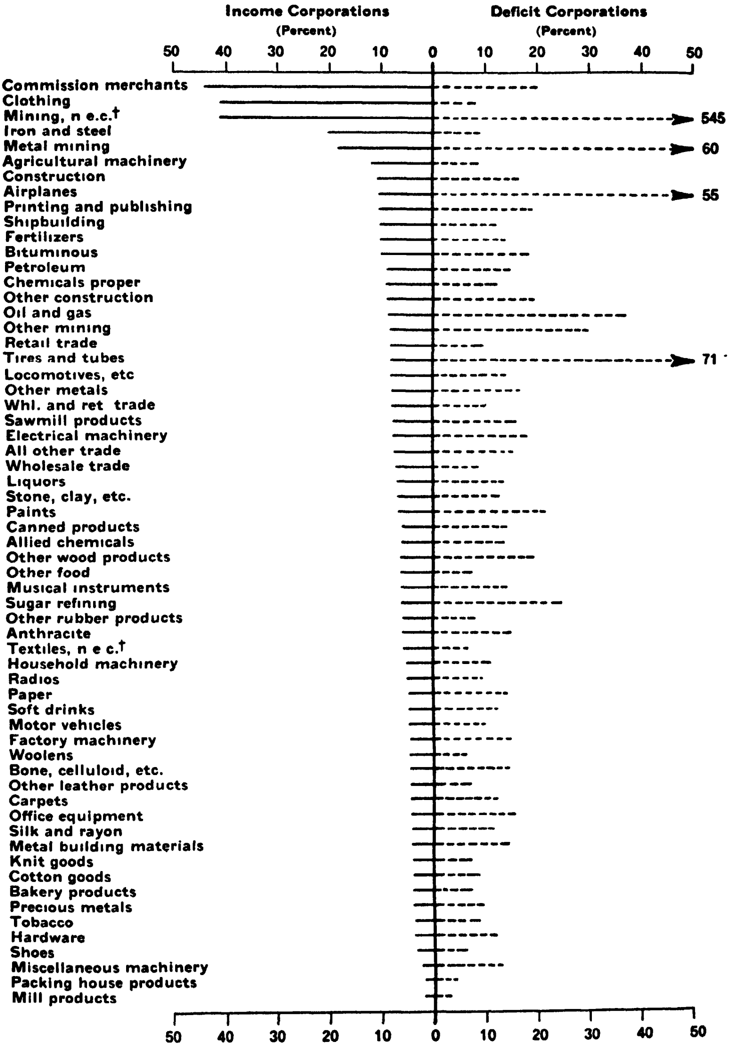
[9] Commission merchants and unclassified mining and quarrying corporations, which have extremely high ratios, are excluded.

[10] It is essential to note that these data refer only to the year-end and may not be an accurate representation of the average relationship for the entire year. However, seasonal variations are not likely to explain the generally higher ratios of accounts payable to sales.

Chart 7—RATIO OF ACCOUNTS PAYABLE TO SALES FOR INCOME AND DEFICIT GROUPS OF MINOR INDUSTRIAL DIVISIONS, 1937*



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*Based on data from *Source Book of Statistics of Income for 1937.* For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

The closest approach to a test of the importance of these factors in relation to the turnover of accounts payable is through a classification of industrial divisions according to producers' and consumers' goods. To a limited extent, this procedure approximates a classification according to the length of the processing period, producers' goods industries having on the average a longer period. The producers' goods industries are also more integrated vertically, on the average. Both these tendencies should make for a greater volume of accounts payable in relation to sales among the producers' industries than among the consumers' industries, and the data confirm this. The use of trade credit by producers' goods industries, which have an average ratio of payables to sales of 9 percent, is significantly greater than the use by consumers' goods industries, which have an average ratio of 6.5 percent.

The extension of trade credit by manufacturing to wholesale and retail trade calls for special comment. In terms of total assets, wholesale and retail trade rely on trade credit to a greater extent than any division of manufacturing. Nevertheless, the turnover of merchandise is so great among trading corporations that the turnover of accounts payable (the balance-sheet ratio that corresponds to the turnover of merchandise) is as rapid as in most branches of manufacturing.

In retail trade, the average length of time during which goods are held in stock corresponds to the period of processing in manufacturing, and the effect of the length of this period on the turnover of payables can be seen in different branches of retail trade. (See Table C-30 in Data Book.) Department stores (including general merchandise and furniture and house furnishings) have a higher ratio of accounts payable to sales (i.e., a lower turnover) than such branches as food, drugs, apparel, and eating and drinking places. Obviously, institutional arrangements as well as the length of the period for which goods are held or processed affect the extent to which trade credit is used. That is, a thorough explanation of industrial differences would require an analysis of the supply as well as the demand for trade credit. The relationship between the supply of trade credit and alternative forms of credit also would have to be considered. To some extent, these factors have already been dealt with in the discussion of receivables. For example, dealers in autos, accessories, etc., probably keep their stock for as long a time, on the average, as department stores, yet they have a much smaller volume of payables in relation to sales, which indicates different institutional arrangements in the case of auto manufacturers than in the case of manufacturers of department store merchandise with respect to the extension of trade credit. The extension of greater facilities of trade credit to department stores in turn probably reflects their higher credit rating, based on a considerably higher profit rate, particularly among the medium-sized and large concerns. Of course, all such interpretations of industrial differences are subject to the qualification that seasonal differences at the year-end may, to some extent, be the basis for apparent industrial differences.

An examination reveals that industrial variations in the ratio of accounts payable to sales are not significantly related to industrial differences either in average asset size or in average profitability. (See Appendix D.) While these factors may be related to the use of trade credit, other elements obscure their effect among industrial divisions.

The similarity between income and deficit concerns in the industrial rankings of the accounts payable/sales ratio is moderately significant. Apparently industrial differences are sufficiently strong so that they are not upset by differences in the level of profitability of corporations in the same industrial division. As in the case of notes payable, a comparison of 1937 and 1931 data is not possible, since notes and accounts payable were combined in the earlier year. In the study of notes payable above, however, we observed a high degree of similarity in the industrial rankings of the ratio of notes plus accounts payable to sales in the two years.

Variations with Corporate Size

The turnover of accounts payable, like that of notes payable, shows no systematic variation with corporate size. (See Table C-22 in Data Book.) Among income corporations, the movements of the ratio are fairly narrow in range; among deficit concerns, the range of the ratio is wider than in the income group. Generally, large and small corporations rely to about the same extent on trade credit to finance their current output. An exception to this behavior is found in trade, which shows a definite tendency for the ratio of accounts payable to sales to increase with size among corporations with assets over $5,000,000. In several branches of manufacturing (metals, liquors, chemicals, and petroleum among others), the ratio rises rather sharply in the largest size class represented. For metals, this sharp rise appears to be due to the presence of the minor industrial division, iron and steel, in the largest size class. The iron and steel industry has a much higher ratio than other divisions in the metals group. The explanation of the sharp rise in the remaining major industrial branches is not clear.

In terms of total assets, accounts payable of manufacturing corporations show a very sharp and fairly consistent decline as corporate size increases. (See Table C-10 in Data Book.) Among manufacturing corporations as a whole, concerns with assets under $250,000 have more than twice as much outstanding trade indebtedness in relation to total assets as corporations with assets over $5,000,000. The downward trend of accounts payable may be due to the relatively high discount rate on trade credit. The larger concerns, having greater access to alternative sources of both long- and short-term credit at lower rates of interest, may economize by substituting such credit for accounts payable. The behavior of trade is not so consistent as that of manufacturing groups: for the income division, the ratio declines until the $500,000 class is reached and then advances; for the deficit division the variation is erratic.

Accounts payable, like notes payable, when compared with total assets exhibit movements that are in striking contrast to those of the ratio based on sales. The ratio to total assets reveals a definite tendency toward the substitution of long-term liabilities for short-term credit as size of corporation increases. On the other hand, the larger, more integrated concerns do not turn over their short-term credit more rapidly than do the small. We have noted previously that the inventory turnover is lower for large than for small corporations. The similarity in turnover of accounts payable among large and small concerns may be attributed to the longer production period among the larger, more vertically integrated concerns. Therefore, the turnover ratio shows no important variation with size, despite the decline in the proportion of trade credit to total assets as size increases. This may also be stated as meaning that accounts payable are closely related to the rate of purchase of raw materials, regardless of the size of the concern.

Variations with Profitability

The turnover of accounts payable is more rapid among income than among deficit corporations. (See Table C-22 in Data Book.) In this respect notes payable and accounts payable are similar. As noted in Chapter 3, the turnover of receivables does not follow the same pattern, the difference between income and deficit corporations being very slight.

In general, the inability of a corporation to earn a net income would make it less able to pay off its trade creditors as rapidly as a profitable concern in a similar industrial division or size class. This tendency was probably accentuated by the sharp decline in business at the end of 1937. A further factor in the situation is the greater ease with which the more profitable concerns can obtain other sources of funds for current operations, particularly from reinvested earnings.

In the section dealing with notes payable, we observed that the more profitable concerns also have a smaller proportion of notes payable to sales than the less profitable enterprises. This indicates that profitable concerns do not tend to substitute bank indebtedness for trade credit; in fact, the ratio of accounts payable to notes payable is greater among income than among deficit corporations, indicating that the more profitable concerns take advantage of their ability to secure trade credit, which although not necessarily cheaper than bank credit is probably more convenient to obtain.[11] The general explanation of the lower turnover of accounts payable among deficit corporations must be, therefore, their slackness in meeting trade debts, not the substitution of trade credit for possibly less easily available bank credit. A supplementary factor is the greater utilization by income corporations of reinvested earnings and capital stock for working capital purposes, which contributes to a smaller relative volume of current

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[11] The comparative ratios of accounts payable to notes payable among income and deficit concerns are as follows:

	Income	*Deficit*
Manufacturing	203.3%	130.2%
Trade	249.7	165.5

indebtedness in both accounts and notes payable among the profitable concerns.

Accounts payable form a larger proportion of the total assets of deficit than of income corporations. (See Table C-10 in Data Book.) This no doubt reflects the shrinkage in the net worth of deficit corporations as well as the fact that deficit corporations are slower in meeting current trade indebtedness.

Although separate data are not available for accounts payable in 1931, the fact that in that year accounts and notes payable combined, as a proportion of either sales or of total assets, were smaller for income than for deficit corporations seems to indicate that the tendencies noted in 1937 are of a relatively stable nature.

ACCRUED LIABILITIES

The widespread development of accrual accounting has made accrued liabilities a balance-sheet item that compares in magnitude with the combined volume of notes and accounts payable. We examined the behavior of accrued liabilities, particularly when compared with sales, among various industries and among corporations of different size and profitability, but we found no results of significance from the point of view of the present study.

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THE CURRENT RATIO AND INTERRELATIONSHIPS OF WORKING CAPITAL ITEMS

ALTHOUGH THE VARIATIONS in individual working capital components, which we have traced thus far, are of independent interest, one important question concerning them naturally arises: Are these variations interrelated to some degree? For example, do industrial differences in notes payable parallel industrial differences in inventory holdings? Similar questions may be asked with reference to the classifications by corporate size and profitability. The most general basis for a consideration of such questions is the relationship between current assets and current liabilities as a whole—that is, the current ratio.[1]

THE CURRENT RATIO

The current ratio occupies a time-honored position in the literature of financial structure, primarily because of its use as a guide in the analysis and prognosis of corporate solvency or financial strength. For the present study a brief treatment of the ratio will suffice to summarize the net effect of the individual variations of current assets and liabilities previously discussed. In certain cases the variations of the current ratio are the product of a constant numerator combined with a changing denominator; and in others the reverse is true. We shall therefore include in our discussion an examination of *total* current assets and *total* current liabilities, separately.

Industrial Variations

The exceptionally high—or exceptionally low—current ratio for a particular industry may frequently be traced to some individual component of the ratio. For example, tobacco products has the highest ratio of all the minor industrial divisions (Chart 8 and Data Book, Table C-28), reflecting primarily the extremely large inventory holdings of curing tobacco. The high ratios for a number of branches of the metals industry also result from relatively large inventory arising from a lengthy production process. On the other hand, the uniformly low current ratio among branches of mining and quarrying is due to the extremely small volume of inventory and receivables in those industries. To single out the numerator rather than the denominator as the determinant of a ratio may be misleading, but it is legitimate in the cases cited since they differ much more sharply in their current assets than in their current liabilities.

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[1] The current ratio is defined as the ratio of cash, marketable securities, receivables, and inventory to accounts payable, notes payable, and "other liabilities." In the reports of the Bureau of Internal Revenue for 1937, "other liabilities" consist primarily of accrued items which properly belong with current liabilities.

For the most part, however, variations in the current ratio are not related to easily identified industrial characteristics. Significant industrial differences revealed by individual working capital items tend to become obscured when the items are combined with other components, to form the current ratio; but since we have not found any single general explanation of industrial variations in the individual components of working capital, the absence of "systematic" behavior in the current ratio cannot be considered surprising.

Despite the fact that a satisfactory general explanation of industrial variations in the current ratio cannot be provided, several tests indicate that these variations are not of a random character. On the basis of the frequency distributions of the SEC data, significant differences appear in the average current ratios of various branches of manufacturing. A comparison of the rankings of income and deficit corporations among the minor industrial groups also reveals a moderate degree of stability in industrial differences, although in this respect the current ratio is less stable than most of its component items.

Certain interesting results are obtained, however, when total current assets and total current liabilities are considered separately. First, the ratio of current assets to total assets reveals no significant difference between producers' goods and consumers' goods industries.[2] On the other hand, current assets are a much

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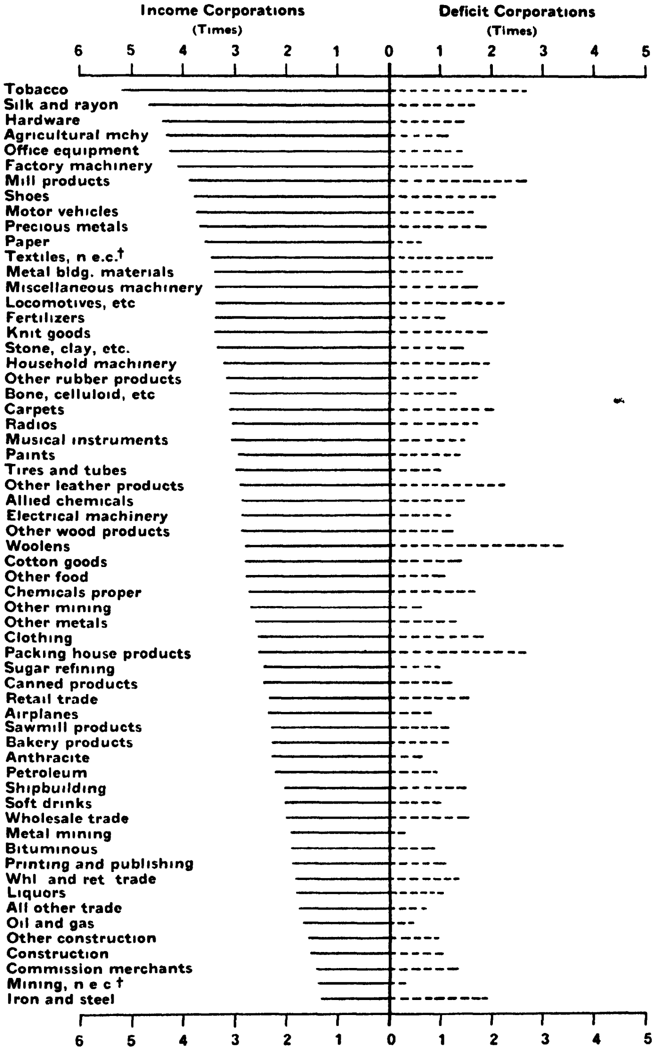
[2] When the minor industrial groups are classified according to producers' goods and consumers' goods industries, the average current ratios for the two groups are 2.8 and 2.5, respectively; the slight difference between the average ratios is of no statistical significance.

Chart 8—RATIO OF TOTAL CURRENT ASSETS TO TOTAL CURRENT LIABILITIES FOR INCOME AND DEFICIT GROUPS OF MINOR INDUSTRIAL DIVISIONS, 1937*



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*Based on data from *Source Book of Statistics of Income for 1937*. For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

higher proportion of sales in producers' goods industries (51 percent) than in consumers' goods industries (38 percent). This reflects the fact that the producers' goods industries are, on the *average, larger and more vertically integrated, which tends to increase the inventory/sales ratio.*

Second, *no appreciable difference between the two classes of* industries is evidenced by the current *liabilities/total* assets ratio. However, the relatively higher proportion of current assets to sales in the producers' goods branches, compared with the consumers' goods industries, appears paralleled by a higher proportion of current liabilities to sales. Current liabilities amount to 19 percent of sales in producers' goods industries, and to 13 percent in the consumers' goods concerns.

The industrial rankings of the ratio of current assets both to total assets and to sales are quite similar to the rankings of the ratio of current liabilities to assets and to sales.[3] An industry that requires relatively large current assets tends to rely to a greater extent on short-term financing than an industry requiring small current assets. If this were not the case, the range of variation of the current ratio would be considerably greater than it is.

Industrial differences in the current ratio are only slightly associated with differences in the average asset size of the minor industrial groups; the ratio shows a mild tendency to rise as size of industry increases. When current assets and current liabilities are studied separately with respect to average asset size no consistent relationship appears. Current assets show an inverse relation in terms of total assets and a direct relation in terms of sales, whereas current liabilities show a fairly strong inverse relation in terms of assets and a nonsignificant relation in terms of sales.

Industrial variations in the current ratio, when related to the profitability of minor industrial divisions, reveal a behavior opposite to that of the components of the ratio. The more profitable industries tend to have relatively high current ratios; but no tendency of this kind is evident when current assets are considered separately. The more profitable industries display a slight tendency toward having a low ratio of current liabilities to total assets, but they show no such tendency when the basis of comparison is sales.

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[3] See Appendix D for the rank correlation coefficients on which this conclusion is based.

Variations with Corporate Size

The current ratio rises fairly consistently as size of corporation increases in most of the major manufacturing groups; but in some groups—notably printing, chemicals, petroleum—and also in construction and wholesale and retail trade the upward tendency is interrupted several times or is entirely absent. (Chart 9. See also Table C-24 in Data Book.) In the light of the variations of the several working capital components as a percentage of sales, discussed in earlier chapters, the behavior of the current ratio may be traced to an increase in the relative importance of current assets as size of corporation increases, accompanied by a relatively steady level of current liabilities. Viewed in terms of ratios based upon total assets, the movements of the ratio may be ascribed to the fact that current liabilities decline more sharply than current assets as corporate size increases.[4]

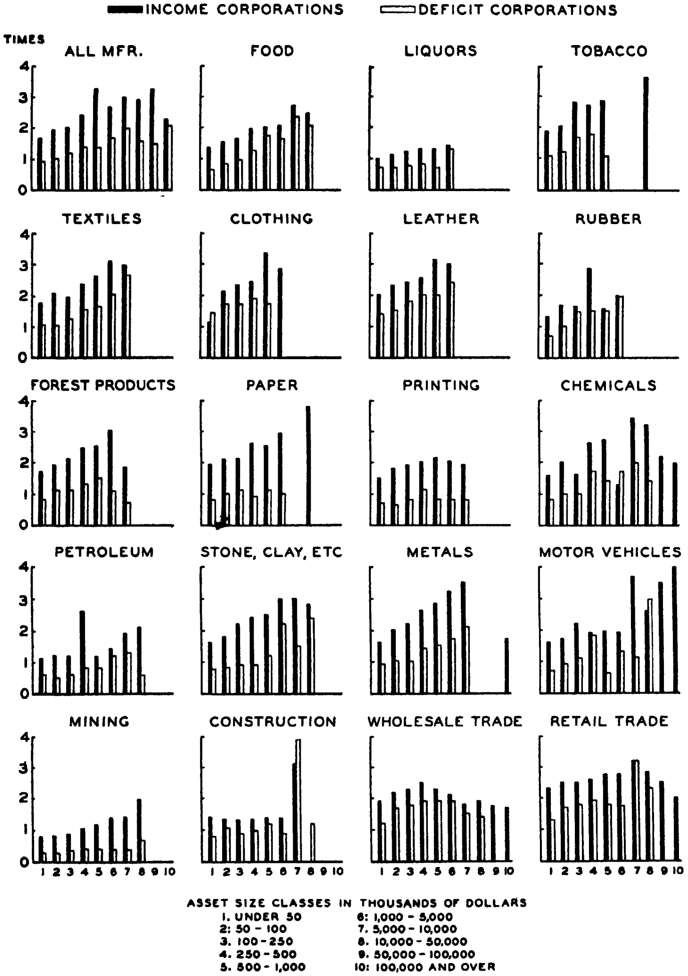
According to the SEC frequency distributions for listed manufacturing corporations the differences between the average values of the current ratio of various size classes are statistically significant. The SEC data also reveal the tendency for the current ratio to increase with corporate size, confirming the general movement shown by the Internal Revenue data. As noted in the previous section, the influence of size on the current ratio is not strong enough to affect the industrial differences in this ratio, the rank correlation with the average asset size of the minor industrial groups being barely above the level of statistical significance.

Variations with Profitability

The differences in the current ratio between income and deficit groups support the traditional view that the level of this ratio is a symptom of financial strength (Charts 8 and 9). Income corporations have a substantially higher volume of current assets relative to current liabilities. Examination of the separate figures

[4] Among the current assets the chief decreases with corporate size are registered by receivables and cash. Inventory varies only moderately and not in a consistently direct or inverse manner. Marketable securities of income corporations in most industries rise as size of corporation increases, while for deficit concerns the movement is irregular.

Chart 9—RATIO OF TOTAL CURRENT ASSETS TO TOTAL CURRENT LIABILITIES FOR INCOME AND DEFICIT GROUPS OF MAJOR INDUSTRIAL DIVISIONS, 1937, BY ASSET SIZE*



*Based on Table C-24 in Data Book (National Bureau of Economic Research). Wholesale and retail trade figures are for the year 1938.

for total current assets and total current liabilities (each as a percentage of total assets) reveals that this feature of the current ratio is the joint result of the behavior of its numerator and denominator. The percentage figures for current assets are substantially larger among income corporations than among corresponding deficit corporations, while the percentages of current liabilities for income corporations are systematically smaller. The association of a high current ratio with a high level of profitability is confirmed by the SEC data.

In view of the marked relationship between the current ratio and profitability it is of interest to inquire whether the variations of the ratio with corporate size noted above can be attributed to variations in profitability among the size classes of the major industrial groups. Inspection reveals that this is not the case. The current ratio characteristically increases with size among both income and deficit concerns, while the ratio of net income to net worth is typically different in the two groups, rising sharply among the deficit group and remaining practically stable for income corporations.

INTERRELATIONSHIPS OF WORKING CAPITAL ITEMS

To what extent do the various working capital assets and liabilities follow a common or related pattern with respect to the threefold classification by industry, size, and profitability? Thus far we have emphasized that the presence or absence of relationships in the static, cross-section picture that we are studying does not necessarily indicate the presence or absence of dynamic relationships between changes in one working capital item and changes in another. In the light of the data already presented we may expect that the nature of the interrelationships among the working capital items will depend to a large extent upon whether sales or total assets are used as the basis of comparison.[5]

Accounts Receivable and Accounts Payable

The extension of credit by corporations is measured by the volume of notes and accounts receivable; and the receipt of credit from other (nonfinancial) corporations is measured by the volume of accounts payable. A comparison of the two balance-sheet items will indicate the positions of certain classes of corporations, either as net creditors or as net debtors. A corporation whose accounts receivable exceed accounts payable (ignoring, for the moment, notes payable and other current liabilities) would, in effect, be acting as a "bank" for the rest of the business community. The volume of receivables in the balance sheets of nonfinancial corporations totaled $15,700,000,000 on or about December 31, 1937, while accounts payable totaled $12,100,000,000. The difference of $3,600,000,000 measures the net extension of credit by incorporated concerns both to other businesses and, in the case of retailers and of manufacturers' sales branches, to consumers.[6]

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[5] The analysis of interrelationships of working capital ratios with respect to industry is based on the computation of rank correlation coefficients between the selected ratios. These are given in Appendix D. Interrelationships with respect to size and profitability are judged by a comparison of the data given in preceding chapters.

Among the minor industrial divisions there is a definite tendency for a high turnover of accounts payable to be associated with a high turnover of receivables and vice versa. In our earlier discussion of the turnover of these two balance-sheet items (Chapters 3 and 4), we observed that both the ratio of receivables to sales and the ratio of accounts payable to sales are significantly higher in the producers' goods than in the consumers' goods industries. The former group of industries, with a longer average period of processing than the consumers' goods industries, apparently utilizes a larger relative volume of trade credit for working capital needs. On the other hand, they extend relatively more trade credit, which may reflect the fact that the purchase of durable producers' goods requires relatively large sums for each individual transaction. Manufacturers selling consumers' goods directly to distributive outlets apparently shift the burden of financing these sales to the purchaser to a greater extent than do sellers of producers' goods.

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[6] The volume of accounts receivable reported in balance sheets is overstated in relation to accounts payable by the amount of checks in the mail issued against current payables, since current payables are reduced without a corresponding reduction in current receivables. This also produces an understatement of corporate cash holdings, since the balance sheets of the paying corporations show a reduced volume of cash holdings, while the accounts of the receiving corporations are not yet credited with this amount. The volume of checks reported as in process of collection by member banks of the Federal Reserve System as of December 31, 1937 was $2,300,000,000. (*Annual Report of the Board of Governors of the Federal Reserve System, 1937*, p. 117.) In *Debts and Recovery* (1938), p. 335, Dr. A. G. Hart offers 75 percent as a "very rough" estimate of the proportion of checks in the mails going to corporations. This would amount to $1,700,000,000 in 1937 and would reduce the difference between accounts receivable and accounts payable from $3,600,000,000 to $1,900,000,000.

Practically all the minor industrial divisions are net creditors with respect to trade credit. In about half of the minor divisions, the volume of receivables is twice or more the volume of accounts payable. Only two groups (iron and steel, and metal mining) are net debtors, while three others (bakery products, canned products, and silk and rayon) show a very slight margin of receivables over accounts payable. These observations refer to income and deficit corporations combined or to income corporations separately; the deficit corporations, as would be expected, include a number of cases in which the minor divisions are net debtors with respect to trade credit.

Table 8 presents further aspects of the short-term creditor-debtor relationships of nonfinancial corporations, with particular reference to variations by size of concern. To simplify the analysis with respect to size, the ten size classes discussed in earlier chapters have been reduced here to four: small, medium-sized, large, and very large corporations. If notes payable, representing indebtedness primarily to banks, are added to accounts payable, nonfinancial corporations as a whole are substantial debtors on short-term account. This is not the case, however, for certain sectors of the corporate population. For example, manufacturing concerns in the income group shown in Table 8 are net creditors; and all nonfinancial corporations in the income group have a ratio of receivables to notes and accounts payable of about 100 percent for the small and very large concerns, and of more than 100 percent for the medium-sized and large corporations.

Contrary to expectations the ratio of receivables to accounts payable does not rise progressively with size throughout the entire range. For all nonfinancial corporations with assets over $10,000,000 the ratio declines to approximately the same level as that for concerns with assets of less than $250,000. This behavior may be due at least partly to the fact that the balance sheets upon which these ratios are based are in an unconsolidated form. The large corporations often have very large selling subsidiaries (as in the petroleum industry) which have on their balance sheets a substantial volume of accounts payable to the parent company. This fact also may explain the drop that occurs between the "large"

Table 8—Creditor-Debtor Relationships among Income and Deficit Corporations, 1937, by Asset Size[a]
(dollar figures in millions)

Size[b]	*Notes and Accounts Receivable*	*Accounts Payable*	*Notes Payable*	*Ratio of Receivables to Accounts Payable* (percent)	*Ratio of Receivables to Notes and Accounts Payable* (percent)
Income Corporations					
All Manufacturing					
Small	$473.0	$286.8	$171.5	165	103
Medium-sized	643.6	335.1	253.4	192	109
Large	1,400.4	685.6	511.2	204	117
Very large	3,272.2	2,313.9	845.2	141	104
All Nonfinancial					
Small	1,713.3	1,075.9	634.9	159	100
Medium-sized	1,716.7	926.0	642.0	185	109
Large	3,003.6	1,722.9	1,107.8	174	106
Very large	5,664.9	4,242.8	1,378.8	134	101
Deficit Corporations					
All Manufacturing					
Small	330.9	362.4	241.8	91	55
Medium-sized	221.9	196.4	190.0	113	57
Large	334.3	250.9	242.5	133	68
Very large	327.3	246.7	137.3	133	85
All Nonfinancial					
Small	1,186.3	1,344.2	853.3	88	54
Medium-sized	659.0	631.6	550.1	104	56
Large	827.4	850.9	764.8	97	51
Very large	919.5	1,317.9	727.8	70	45
Income Plus Deficit					
All Manufacturing					
Small	803.9	649.2	413.3	124	76
Medium-sized	865.5	531.5	443.4	163	89
Large	1,734.7	936.5	753.7	185	103
Very large	3,599.5	2,560.6	982.5	140	102
All Nonfinancial					
Small	2,899.6	2,420.1	1,488.2	120	74
Medium-sized	2,375.7	1,557.6	1,192.1	153	86
Large	3,831.0	2,573.8	1,872.6	149	86
Very large	6,584.4	5,560.7	2,106.6	118	86

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[a] Based on data, as of December 31, 1937, from *Statistics of Income for 1937*, Part 2, and *Source Book of Statistics of Income for 1937.*

[b] The asset-size classes (inclusive of the lower limit and exclusive of the upper) are as follows:

Small:	Less than $250,000
Medium-sized:	250,000–1,000,000
Large:	1,000,000–10,000,000
Very large:	10,000,000 and over

and the "very large" corporations, since the effect of increasing equally the numerator (receivables) and the denominator (accounts payable) when a ratio is greater than one is, of course, to decrease the ratio.

The ratio of receivables to total assets and the ratio of accounts payable to total assets both decline as size of corporation increases (see Chapters 3 and 4), with the accounts payable/total assets ratio showing the greater decrease. On the other hand, the ratio of receivables to sales tends to rise slightly as corporate size increases, while the turnover of accounts payable varies irregularly and moderately from size class to size class. Comparison of both types of ratio shows that as corporate size becomes larger the balance of receivables over accounts payable tends to increase somewhat, although this movement is by no means uniform and does not apply to all branches of industry.

The relationships of the two balance-sheet accounts with respect to profitability may be considered in terms of their turnover among the income and deficit groups. The turnover of receivables is slightly lower, and the turnover of payables is considerably higher, among income than among deficit concerns.

Inventory and Notes Payable

Some relationship between inventory—the most important component of current assets—and notes payable—an important source of current financing—might be expected, but the data for the most part do not support this expectation. To be sure, those minor industrial divisions that have a relatively high ratio of inventory to total assets show a moderate tendency to have a high percentage of notes payable. The implications of this relationship are strongly reduced, however, by the fact that no such general relationship exists when the two accounts are compared upon the basis of sales. Individual cases of parallel variation of the inventory/sales ratio and the notes payable/sales ratio occur, but in general the relationship is statistically nonsignificant.[7]

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[7] Illustrations of relationship are found, for example, in canned products industries which have correspondingly high ratios of inventory and notes payable to sales; and in bakery products, in which the ratios are correspondingly low. Such cases are not frequent enough to constitute a general tendency. Since the volume of inventory in both income and deficit groups is much greater than the volume of notes payable, the absence of a systematic relationship is to be expected, particularly since notes payable are an optional form of current financing.

There is little evidence of covariation between inventory and notes payable with respect to differences in corporate size. On the basis of sales, inventory grows relatively larger as size increases, while notes payable generally show no systematic variation.[8] When compared with total assets, inventory is generally largest among the medium-sized corporations, while notes payable, on the whole, decline as corporate size increases.

For income and deficit corporations, inventory and notes payable as a percentage of sales do not follow a related pattern: The inventory/sales ratios are slightly higher among income than among deficit corporations, while the notes payable/sales ratios are appreciably higher among deficit than among income corporations. Absence of relationship is also found when total assets are the basis of comparison.

Diverse reasons for the variation among industrial divisions of the turnover of inventory have been discussed in Chapter 2. The degree of relationship between inventory turnover and the turnover of notes payable will depend upon the reason for the high or low inventory turnover. Short-run changes in the volume of inventory, whether of a seasonal, cyclical, or random character, require short-term financing from such sources as commercial banks. The degree of dependence upon short-term credit as a source of funds may vary according to whether the change in the volume of inventory occurs at an early phase of a revival, when internal sources of funds are limited, or at a later phase of recovery. When inventory is durable or when the seasonal and style factors are unimportant, working capital needs may be met largely from permanent funds derived from non-current liabilities.

The relationships between inventory and accounts payable are, on the whole, similar to those described above, since accounts payable display a variation with industry, size, and profitability that parallels notes payable, with few exceptions. In particular, accounts payable, like notes payable, finance a much smaller proportion of the inventories of large than of small manufacturing corporations.

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[8] However, the two items, when compared with sales, show similar variations from one size class to another in the following groups: liquor, tobacco, textiles, clothing, leather, forest products.

Accounts Payable and Notes Payable

The relationship between the balance-sheet accounts which represent trade credit and bank credit is of particular interest because it bears upon the question whether these two items tend to substitute for one another in particular classes of corporations. The weight of the evidence points to the conclusion that notes and accounts payable are more complementary than competitive, both in their employment by, and in their availability to, corporations. Industries with a high proportion of notes payable do not generally have a low percentage of accounts payable, whether the basis of comparison is assets or sales. A few exceptions to this are found among industries purchasing raw materials in organized markets in which accounts payable are not available. With respect to size, both items when expressed as a percentage of sales show no systematic variation; when compared with total assets, they decline. Finally, both notes and accounts payable are substantially greater among deficit than among income corporations, regardless of the basis of comparison.

Cash and Marketable Securities

As in the case of notes and accounts payable, the most interesting question with respect to cash and marketable securities is whether they show a tendency to act as substitutes for each other. Among the minor industrial divisions those corporations with a relatively small volume of cash (as a percentage of total assets) show no consistent tendency to hold a relatively large volume of marketable securities, or vice versa. On the other hand, as corporate size increases the percentage of total assets in the form of cash declines, while the proportion of marketable securities increases. When income and deficit corporations are compared, no systematic tendency toward substitution is observed.

Cash and Notes Payable

Nonfinancial corporations as a whole are neither net debtors nor creditors of the banks, when the ratio of cash to notes payable is used as a measure. The corporations' cash holdings of $6,700,000,000 at the end of 1937 just equaled their outstanding short-term obligations in the form of notes payable. Manufacturing corporations as a group were net creditors to a slight degree, the ratio of cash to notes payable being 127 percent. Trade corporations, on the other hand, were net debtors, with a ratio of 77 percent. Among the sixty-one minor divisions, thirty-six were net creditors. The median value of the ratio among the minor industrial divisions was 117 percent, with the first quartile at 76 percent and the third quartile at 161 percent. (See Table C-28 in Data Book.)

The ratio of cash to notes payable tends to increase with corporate size, although not in a very consistent fashion. Both cash and notes payable (as a percentage of total assets) decline as corporate size increases, and the upward movement in the cash/notes payable ratio may result from the sharper decline in the notes payable item. Small and medium-sized corporations, with assets under $1,000,000, tend to be net debtors to the banks, while among the larger concerns the volume of cash typically exceeds the notes payable outstanding by substantial margins.

A comparison of the ratios for the income and deficit groups reveals, as might be expected, that the income corporations are net creditors of the banks while the deficit corporations are net debtors. The difference between the levels of the ratios is large. For nonfinancial corporations as a whole the ratio for the income group is 146 percent; and that for the deficit group, 40 percent. For all manufacturing corporations the ratios are 166 and 41 percent for income and deficit corporations, respectively. The ratios for income and deficit corporations of certain industries are in fact the reverse of those for the group as a whole. However, it may be stated that roughly 70 percent of the assets and 72 percent of the sales of all nonfinancial corporations are represented by corporations which are to some extent net creditors of the banks.

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FIXED CAPITAL ASSETS AND LONG-TERM INVESTMENTS

FIXED CAPITAL ASSETS and long-term intercorporate investments both have characters somewhat different from the relatively short-term assets and liabilities discussed in previous chapters, since they represent past prices and revaluations to a considerably greater extent, on the average, than the working capital components. This fact is particularly relevant to the analysis of ratios involving fixed capital assets. A comparison of fixed capital assets with either sales or total assets involves two valuations which are, to some extent, related to different periods of time and to different levels of prices. Each ratio, therefore, provides a measure of operating relationships which is less accurate than the ratios for the current items, although we must hasten to add that the latter ratios are not completely free of the same criticism, particularly in periods of rapidly changing prices. On the other hand, since long-term assets are not subject to seasonal fluctuations, ratios of these items to sales may express inter-industrial differences more significantly than do the ratios for the current items. This is not necessarily true of the ratios based on total assets, however, since cyclical and seasonal fluctuations in the other balance-sheet components may affect the relative proportion of the long-term assets.

FIXED CAPITAL ASSETS

Industrial Variations

Fixed capital assets of all nonfinancial corporations in the United States in 1937 constituted 56 percent of total assets. This figure reflects the heavy fixed capital investments of public utilities and railroads; the ratios for manufacturing and trade were 39 and 20 percent, respectively. The turnover of fixed capital for all nonfinancial concerns, measured in terms of sales, was 1.4 times per annum; for manufacturing and trade as a whole, it was 2.8 and 11.5 times per annum, respectively. The trade figure reflects primarily the turnover in retail trade; in wholesale trade, where fixed capital assets are not so important, the turnover was about three times as rapid as in retail trade. Measured in terms of commodity production, the fixed assets of manufacturing and trading concerns, incorporated and unincorporated, were the equivalent of six months' output.[1] For manufacturing, fixed capital assets (at current valuations) exceeded inventory by a half; in retail trade, the value was almost equal to that of inventory; and in wholesale trade, fixed capital assets were about one-third the size of inventory.

A comparison of the ratio of fixed capital assets to sales and the ratio to total assets reveals a high degree of similarity in the rankings of the minor industrial divisions for both income and deficit corporations—a condition that reflects the pronounced differences in fixed capital assets among industries (Chart 10 and Table C-28 in Data Book). Further indication of the marked differences in capital assets among industries is found in the fact that the industrial rankings of the ratios for 1937 and 1931 resemble each other closely and to a greater extent than in the case of any other balance-sheet account.[2]

Among the minor industrial divisions differences in the two fixed capital ratios appear to be based largely upon differences in techniques of production. Relatively high ratios (particularly on a sales base) are found in a number of industries making predominantly producers' goods, such as stone, clay, and glass products, railroad equipment, and various branches of metal products. At the other end of the scale are industries predominantly representative of consumers' goods, such as clothing and apparel, packing house products, boots and shoes, musical instruments, precious metals, and tobacco. A formal test of the classification according to producers' and consumers' goods for the ratio of fixed capital to sales reveals that producers' goods industries have a significantly higher average (43 percent) than the consumers' goods industries

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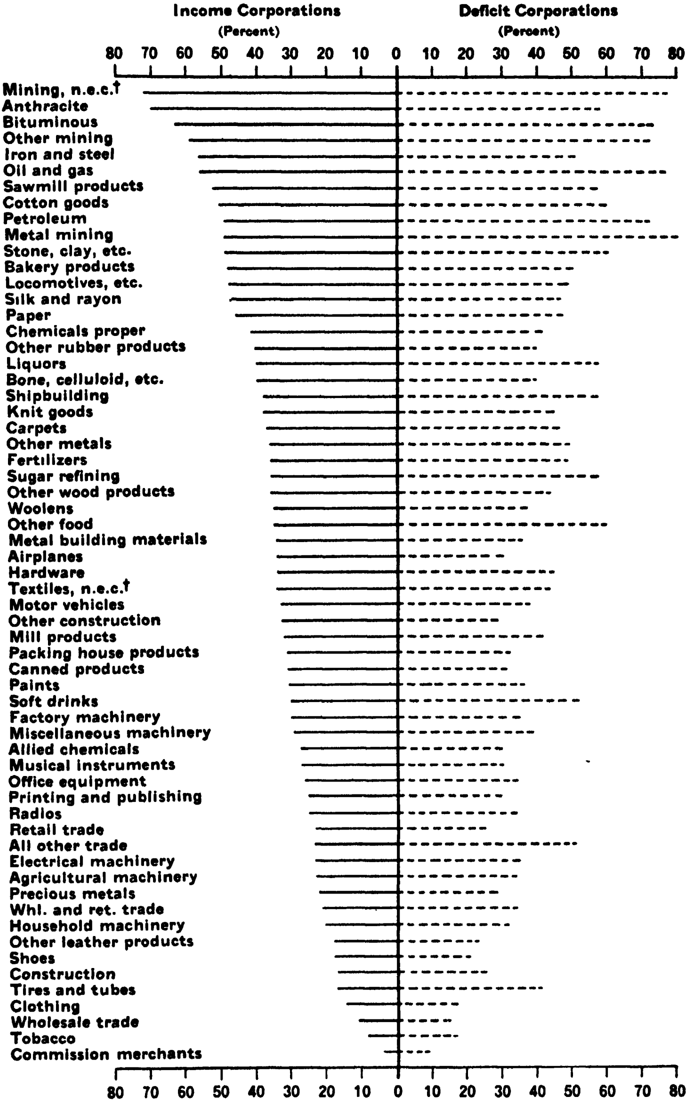
[1] The fixed capital assets of unincorporated enterprises were estimated from census data on sales in the same manner as was inventory in Chapter 2. Data on commodity production were secured from unpublished estimates of Mr. George Terborgh, formerly of the Board of Governors of the Federal Reserve System.

[2] A test of the SEC data for the ratio of fixed capital to total assets reveals that industrial differences among major groups are statistically significant. The major industrial groups, however, are not a very satisfactory basis of classification with respect to fixed capital assets, since the industrial variation within these categories is considerable. For example, the food group includes packing houses, with a very low ratio of fixed capital to sales, and sugar refining, with a high ratio. Textiles and metals likewise include minor industrial groups with widely differing ratios.

Chart 10—RATIO OF FIXED CAPITAL ASSETS TO TOTAL ASSETS FOR INCOME AND DEFICIT GROUPS OF MINOR INDUSTRIAL DIVISIONS, 1937*



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*Based on data from *Source Book of Statistics of Income for 1937*. For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

(30 percent). This difference may reflect a greater degree of vertical integration as well as a greater use of heavy, elaborate, and more expensive machinery among concerns in the producers' goods classification.

Industrial differences in fixed capital assets are associated to some extent with differences in the average asset size of corporations, the capital assets being relatively greater among industries that include corporations of large average size. The relationship is stronger for the fixed capital/sales ratio than for the fixed capital/total assets ratio, possibly because of a greater tendency toward vertical integration among the large corporations.

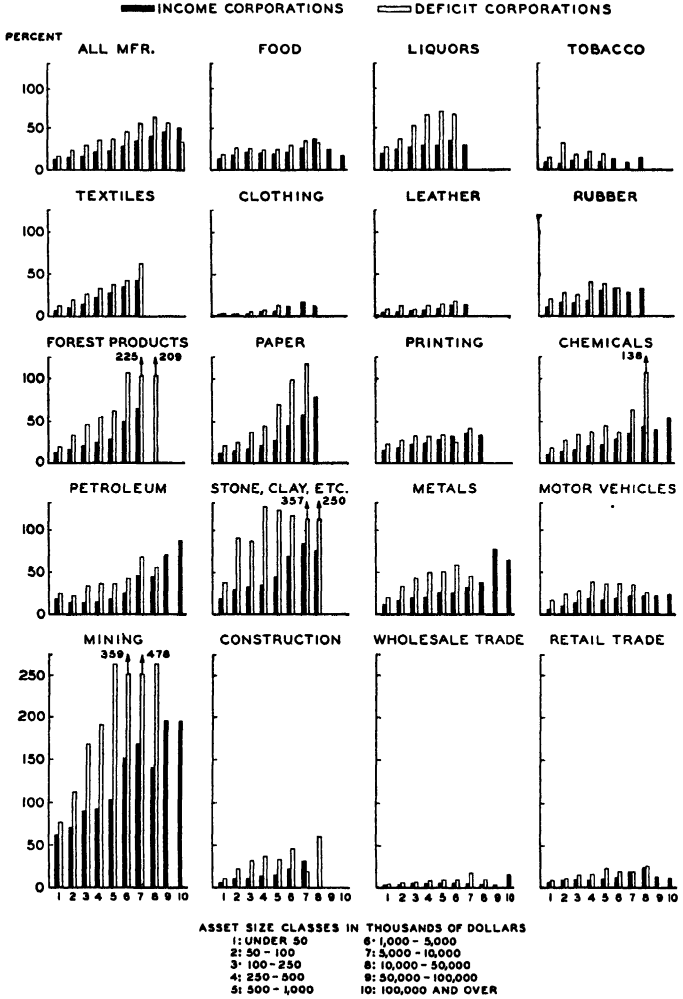
Industrial differences in profitability are not strongly related to industrial differences in the fixed capital ratios. The more profitable groups show a slight tendency toward having low ratios of fixed capital assets to sales, but no significant rank correlation is evident for the ratio of fixed capital to total assets. Such results are to be expected: A high turnover of fixed capital would be symptomatic of a relatively high level of profitability, other things being equal; on the other hand, there is little reason why profitable industries, compared with unprofitable groups, should have relatively smaller or larger investments in fixed than in current assets, despite the fact that they can afford larger investments in improved machinery and equipment. The reason for this is that the profitable industries also have larger investments in cash and marketable securities as well as in inventories and receivables, with the result that there is little difference between the fixed capital/total assets ratio among industries of varying profitability.

Variations with Corporate Size

A popular assumption has been that the larger the size of corporations the greater their ability to take advantage of more efficient techniques calling for large fixed capital investments. Do the data on fixed capital assets support this assumption?

When compared with sales, the fixed capital assets of most major industrial groups increase with size sharply and, on the whole, consistently (Chart 11). Comparisons of the ratios for income and deficit corporations of the same industry for the same year, and of those for 1937 and 1931, reveal a high degree of similarity. Superficially, this strong positive variation of the fixed

Chart 11—RATIO OF FIXED CAPITAL ASSETS TO SALES FOR INCOME AND DEFICIT GROUPS OF MAJOR INDUSTRIAL DIVISIONS, 1937, BY ASSET SIZE*



*Based on Table C-20 in Data Book (National Bureau of Economic Research). Wholesale and retail trade figures are for the year 1938.

capital/sales ratio might be taken as striking evidence of the substantial use of labor-saving machinery among large corporations. In all probability, however, the result is largely attributable to another factor, namely vertical integration, which, as we have seen in the analysis of the turnover of inventory, tends to increase with corporate size, and the general effect of which is to increase the volume of assets relative to the volume of sales. A large proportion of heavy equipment and vertical integration would contribute to the same result; the separate contribution of each factor cannot, of course, be determined.

The ratio of fixed capital to total assets shows less consistent and less pronounced variations with corporate size than the capital assets/sales ratio. In manufacturing as a whole and in slightly over half the major industrial divisions, a mildly direct relationship is evident between the ratio and the size of corporations, although the variations are not highly consistent from one size class to another. A large number of groups, such as food, tobacco, clothing, leather, printing, motor vehicles, construction, and wholesale and retail trade, exhibit inverse or highly erratic variations. (See Table C-8 in Data Book.)

In interpreting the variations of the fixed capital/total assets ratio due weight must be given to the fact that the data have been taken from unconsolidated balance sheets, in which the ratio of intercorporate investments to total assets increases sharply with the size of corporation. Consolidated statements undoubtedly would show a stronger tendency for the ratio of fixed capital to total assets to increase with corporate size; but the rise of even this ratio would not be so sharp as that of the ratio of fixed capital assets to sales. The ratio of fixed capital to total assets, based on SEC data which are filed largely on a consolidated basis, varies erratically, except for a fairly sharp rise among corporations with total assets of more than $100,000,000. A formal test shows that the differences among size classes are not statistically significant.[8]

[8] The ratio of fixed capital assets to total assets, based on the SEC data, varies with corporate size as follows:

Asset Size (in millions)	*Ratio* (percent)	*Asset Size* (in millions)	*Ratio* (percent)
Under $1	37.9	$20– 50	43.5
1– 3	39.6	50–100	39.6
3– 5	37.2	100–200	47.9
5–10	39.6	200–500	50.9
10–20	40.0	500 and over	54.7

Variations with Profitability

Income corporations have a consistently smaller proportion of fixed capital assets than have deficit corporations, whether the basis of comparison is total assets or sales, although the difference is more pronounced in the case of the ratio based on sales. The SEC data confirm this inverse relationship and show it to be statistically significant, as among various profitability classes.

In the case of the fixed capital/sales ratio, the higher ratios for unprofitable concerns reflect the fact that sales have been reduced without a corresponding change in the value of the fixed assets, at least in the short run. As for ratios to total assets, the same contraction of sales is reflected in an eroded working capital position, so that the proportion of fixed to total assets is relatively high.

LONG-TERM INVESTMENTS

The statutory requirement since 1934 that balance-sheet data submitted to the Bureau of Internal Revenue be in an unconsolidated form, even when affiliates are fully owned, brings into relief, as it were, the widespread volume of intercorporate investments in nonfinancial as well as financial institutions, and has its repercussions upon the interpretation of practically all other balance-sheet accounts. On the one hand, it permits the sharper delineation of intercorporate financial relationships. On the other hand, it makes for a rigid separation of corporations which are in actuality operated as a single unit with respect to management policy and financing, and, therefore, it may obscure the broader outlines of financial structure. Fortunately, in *Statistics of Income for 1934,* Part 2, data are available which reveal the effect of the prohibition of consolidated returns upon financial structure. This question is dealt with in Appendix C. The present section is based entirely upon unconsolidated balance sheets.

In 1937 investments of all nonfinancial corporations, apart from their holdings of government securities, amounted to $22,400,000,000, or 14 percent of their total assets; while for all manufacturing corporations, they equaled $8,400,000,000, or 15 percent of total assets.[4] The magnitude of intercorporate invest-

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[4] In *Statistics of Income for 1937,* Part 2, these investments are described as "investments other than government obligations." By far the largest component of this item is investments in affiliates, but those marketable securities that are not government

ments can also be appraised by comparison with the total of stocks and bonds outstanding. Investments of nonfinancial corporations were 21 percent, and of manufacturing corporations 8 percent, of the stocks and bonds of all nonfinancial corporations. If financial corporations are included, intercorporate investments are, of course, much larger, indicating that "approximately half of corporate America is owned by the other half of corporate America."[5]

Still another basis for appraising the volume of intercorporate investment is a comparison of corporate income from dividends with corporate dividend disbursements. All corporations, including financial and nonfinancial, received 34 percent of all corporate dividend disbursements in 1937; nonfinancial corporations received 15 percent, and all manufacturing corporations 7 percent. Over half of the dividend disbursements were received by corporations with assets of $100,000,000 or more.

Industrial Variations

In general, a definite relation between the volume of intercorporate investments and particular industries—apart from such outstanding exceptions as utilities holding companies—is not to be expected, and the results confirm this expectation. For the minor industrial divisions the ratio of investments to total assets varies within limits of 5 and 27 percent, with the central half of the distribution between 8 and 17 percent. (See Table C-28 in Data Book.) Among the heterogeneous group with large intercorporate investments are metal mining, household machinery, electrical machinery,

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obligations, as well as mortgages and various notes owned by corporations, are also included. Our analysis treats "investments other than government obligations" as if they were entirely investments in affiliated corporations, and for convenience we shall call them simply "investments."

The extent to which "investments" are neither marketable securities nor investments in affiliates is indicated by data in *Statistics of American Listed Corporations*. An intermediate category, "other security investments," consists of nongovernmental securities, mortgages, long-term notes of various sorts, etc. In the consolidated balance sheets of the SEC, this category is actually larger than investments in affiliates, although this would not be true if unconsolidated statements were filed. The importance of such investments in the *Statistics of Income* data may be estimated indirectly by comparing them with marketable securities listed by the SEC and then comparing marketable securities with "other investments" in *Statistics of Income*. On this basis they would total 17 percent of the "other investments" of all manufacturing corporations, which represents an upper limit, since the proportion would probably be smaller in the smaller corporations.

[5] See C. J. Hynning, *Taxation of Corporate Enterprise*, Temporary National Economic Committee, Monograph No. 9 (Washington, 1941) p. 40.

sugar refining, tires and tubes, and chemicals; and the group of industries with small intercorporate investments is equally diverse.

These industrial differences do not appear to be related to either the average asset size or the profitability of the minor industrial divisions. A low correlation between the rankings of income and deficit corporations provides further evidence of the unsystematic variation of intercorporate investments; and classification into producers' and consumers' goods industries also reveals no significant differences. Finally, the industrial rankings of 1937 and 1931 show little similarity, although part of this difference can no doubt be explained by the discontinuation of the privilege of filing consolidated returns in 1934.

Variations with Corporate Size

For all major industrial groups, the proportion of investments to total assets becomes progressively and substantially greater as size of corporation increases. (See Table C-7 in Data Book.) The ratio of investments to total assets for the income division of manufacturing corporations as a whole rises from 2 percent for the smallest size group to 24 percent for the largest size group; the corresponding range for the deficit divisions is from 2 to 15 percent: The difference between the smallest and largest size classes for manufacturing as a whole is about as great as that between the lower and upper extremes among the minor industrial divisions.[6]

The number of subsidiaries per corporation also increases sharply with corporate size. The SEC data show that the average number of subsidiaries varies from less than one for corporations with assets of less than $1,000,000 to sixty for concerns with assets over $500,000,000.[7]

Variations with Profitability

Although profitable corporations own a larger interest in other concerns than the unprofitable corporations in corresponding groups, the differences between income and deficit corporations are less pronounced than might be anticipated. The sharpest differences appear between income and deficit corporations of the larger concerns, in which intercorporate investments are heavy. Among the smaller size classes, in which investments are unimportant in general, the deficit corporations have slightly larger investments than the corresponding income concerns; this probably is due to adverse operations, which have reduced their current assets, rather than to an active policy with respect to investments.

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[6] Since consolidated returns were permitted in 1931, the increase with corporate size of the ratio of investments to total assets would be expected to be less in that year than in 1937. Surprisingly, the 1931 variations are much the same as those in 1937, with respect to both the absolute level and the relationship with size. For a further discussion of this puzzling result see Appendix C.

[7] See *Statistics of American Listed Corporations*, Table 49, p. 166. The data refer to 1,741 corporations in manufacturing, trade, mining, and public utilities.

That the link between investments and profitability is not very strong is indicated by the absence of any significant relationship between the profitability of the minor industrial groups and the relative volume of their investments. There is also little evidence that the variation of the ratio of investments to total assets with corporate size is related to the systematic differences in profitability among various size classes.

Other Aspects of Intercorporate Investments

Thus far we have dealt only with the relative volume of intercorporate investments, without giving attention to the frequency of their appearance in different groups of corporations or to the degree of ownership of the subsidiary by the parent. Such data are not available in *Statistics of Income*, but are found for large corporations in *Statistics of American Listed Corporations*. Fifty-six percent of the listed corporations had at least one subsidiary in 1937, and the total number of subsidiaries of all types was 13,233.[8] According to the SEC's regulations, no subsidiary which is not at least majority owned (50 percent or more) may be consolidated. The total number of active, domestic subsidiaries of the listed corporations which were consolidated in 1937 was 6,175, amounting to 47 percent of all subsidiaries and 75 percent of all active, domestic subsidiaries.[9] The number of subsidiaries per corporation varied considerably among industrial groups. Utilities ranked highest with an average of 21 per corporation. Manufacturing corporations as a whole had 6 subsidiaries per corporation, while merchandising concerns had 5. Among manufacturing concerns, the largest average number of subsidiaries was found in petroleum refining, followed by rubber and nonferrous metals. At the other end were textiles, tobacco, and beverages.[10] Practically all registrants with assets of over $50,000,000 had active subsidiaries, while only 45 percent of those with assets of less than $10,000,000 had such subsidiaries.

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[8] The SEC recognizes three types of subsidiaries: totally-held, majority-owned, and significant. A majority-owned subsidiary is defined as one of which securities representing in the aggregate more than 50 percent of the voting power are owned directly by its parent and/or one or more of the parent's majority-owned subsidiaries. A significant subsidiary is one with any of the following characteristics: (1) The parent corporation's advances to it exceed 5 percent of the parent's assets; (2) assets of the subsidiary exceed 5 percent of the assets of the parent and the parent's subsidiaries; (3) sales and operating revenues of the subsidiary exceed 5 percent of the sales and operating revenues of its parent and the parent's subsidiaries; (4) the subsidiary is the parent of one or more subsidiaries and together with such subsidiaries would, if considered in the aggregate, constitute a significant subsidiary. See Securities and Exchange Commission, *Regulation S-X Under the Securities Act of 1933 and the Securities Exchange Act of 1934* (Washington, 1940) pp. 1-2.

The SEC data also throw light on the extent to which subsidiaries may be consolidated when that privilege is available. In 1937, 70 percent of the total number of subsidiaries were consolidated. The categories of consolidated and completely owned subsidiaries are not identical, although they are closely associated. Of the active, domestic subsidiaries 75 percent were consolidated. Ninety percent of these consolidated subsidiaries were fully controlled. The remaining 10 percent of the consolidated subsidiaries were majority owned. Only 41 percent of the unconsolidated subsidiaries were fully controlled.

INTANGIBLES

Although of minor importance in the balance sheet as a whole, patent rights, goodwill, bond discount, and related items are substantial in some corporations. This group of intangibles is not given separately in the Internal Revenue reports, which provide a somewhat broader category called "other assets." "Other assets" in 1937 amounted to 5 percent of total assets and 14 percent of the fixed capital assets of all manufacturing corporations. From *Statistics of American Listed Corporations* we find that 3 percent of the total assets and 6 percent of the fixed capital assets of listed manufacturing corporations were net intangibles. On the basis of

[9] Among the listed corporations themselves 141 registrants were consolidated subsidiaries of other registrants, with assets of over $13,000,000,000. In the various tabulations of financial characteristics in *Statistics of American Listed Corporations,* these concerns have been removed to avoid duplication.

[10] See *Statistics of American Listed Corporations,* pp. 161 ff.

this information we may infer that between one half and two thirds of "other assets" are intangibles. SEC data show that 50 percent of all listed corporations and 67 percent of listed manufacturing corporations reported some intangibles in 1937.

Since "other assets" are a relatively unimportant component of the balance sheet, the data in Table 9 are presented only for broad industrial groups; and the comparisons are made in terms of fixed capital assets, because of the small size of "other assets" relative to total assets. Industrial variations in "other assets" are sizable. Tobacco, printing and publishing, clothing, rubber products (in-

Table 9—RATIO OF "OTHER ASSETS" TO FIXED CAPITAL ASSETS, 1937, BY INDUSTRIAL GROUPS[a]
(in percent)

Industry	*"Other Assets" to Fixed Assets*	
	Income	Deficit
All corporations	10.1	11.8
Mining and quarrying	5.7	5.0
All manufacturing	12.6	17.7
Food	14.3	11.3
Liquors	23.2	13.6
Tobacco	98.1	88.1
Textiles	6.1	8.5
Clothing	41.7	24.2
Leather	27.0	20.6
Rubber	36.9	12.6
Forest products	5.9	8.9
Paper	6.8	12.7
Printing	79.7	66.0
Chemicals	19.3	52.9
Petroleum	3.7	5.1
Stone, clay, glass	6.2	10.2
Metals	9.3	28.3
Motor vehicles	11.0	21.1
Trade	20.5	27.8
Wholesale	32.4	32.1
Retail	15.0	22.4
Service	7.8	5.3
Finance	37.3	33.5
Transportation and public utilities	4.6	6.2

[a] Ratios for all groups except Trade are based on data from *Statistics of Income for 1937*, Part 2; those for Trade are based on data from *Statistics of Income for 1938*, Part 2.

come group), and chemicals (deficit group) have particularly large intangibles in relation to the investment in fixed capital. The ratio of intangibles to fixed capital assets varies irregularly with corporate size, although corporations with assets under $250,000 have considerably higher percentages than corporations of larger asset size. The differences between the ratios of income concerns and those of deficit corporations are unsystematic.

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LONG-TERM DEBT AND NET WORTH

THE FORCES AFFECTING the character and relative proportions of long-term debt and net worth are so numerous and so difficult to appraise in quantitative terms that the interpretation of variations in these accounts with respect to industry, size, and profitability is bound to be hazardous. Such factors as depreciation policy, the reinvestment of earnings, corporate taxation, and security market regulations are among the complex forces (other than cost considerations and market conditions) which result in the financial plan of an enterprise. The declaration of stock dividends, the revaluation of stock, the sale of stock at a premium or discount, and various other surplus adjustments also should be mentioned. Nevertheless, interest remains in the analysis of net worth and long-term debt, according to industry, size, and profitability, if for no other reason than to determine whether such factors tend to eliminate any systematic pattern in these elements of financial structure.

DEBT AND EQUITY CAPITAL

To what extent does the proportion of owned assets vary among different classes of corporations? In answering this question, we shall use the ratio of net worth to total assets, rather than the more conventional ratio of net worth to total debt, because the former may be compared directly with ratios of other items to total assets, which we have examined in previous chapters.

Certain broad industrial variations in the ratio of net worth to total assets are of interest. Manufacturing as a whole has the highest ratio (74 percent) and is followed closely by mining (72 percent); trade corporations are in an intermediate position (60 percent); and construction (52 percent) is the lowest of the major groups included in our survey.[1] Chart 12 reveals that the

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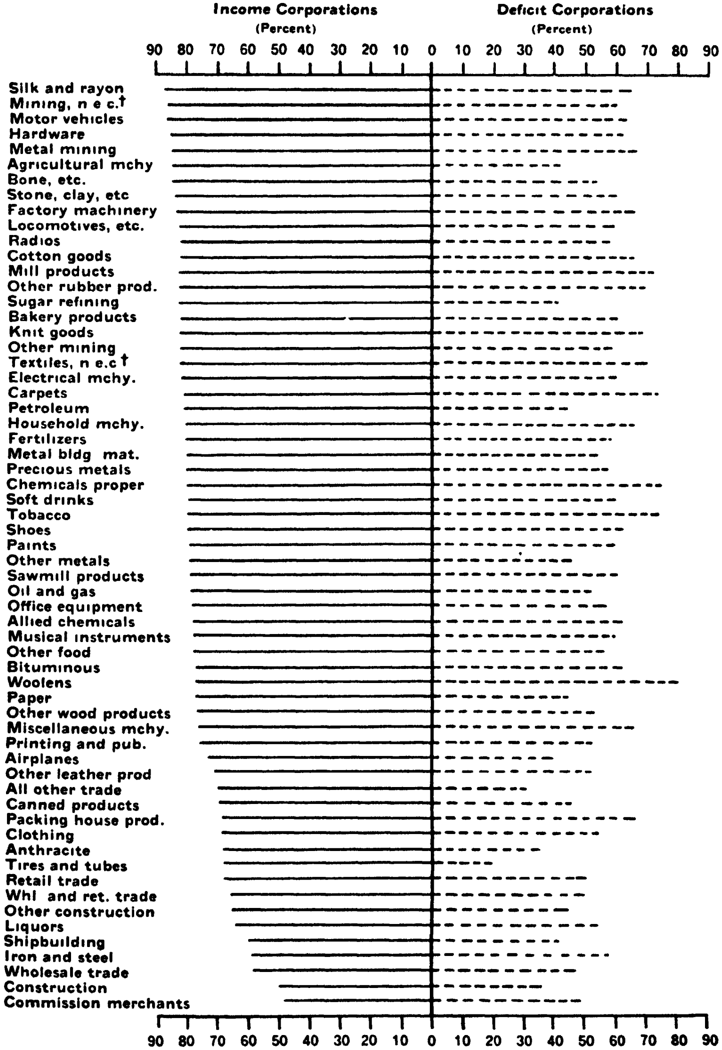
[1] The utilities, railroads, and service corporations—which are not included in our study—have ratios of 55, 45, and 34 percent, respectively.

Chart 12—RATIO OF NET WORTH TO TOTAL ASSETS FOR INCOME AND DEFICIT GROUPS OF MINOR INDUSTRIAL DIVISIONS, 1937*



*Based on data from *Source Book of Statistics of Income for 1937*. For composite of income and deficit corporations, see Data Book (National Bureau of Economic Research) Table C-28.

†Not elsewhere classified.

industrial rankings of income corporations frequently differ from those of the corresponding deficit concerns, although the rank correlation between the two groups is above the level of statistical significance. Some evidence of the stability of the industrial differences is afforded by the considerable similarity between the rankings of the ratio in 1937 and in 1931. A test of the SEC data also reveals significant differences in the proportion of equity capital among the major industrial divisions.[2] The evidence on the whole indicates that industrial variations in the proportion of equity capital are not the product of mere random forces. Classification according to producers' and consumers' goods industries does not yield significant differences, however.

In both income and deficit corporations of the major industrial divisions the ratio of net worth to total assets tends to increase consistently with size of corporation (Chart 13).[3] This behavior is complementary to the inverse variation with size of the current liabilities as a percentage of total assets. The variation of the net worth/total assets ratio reflects primarily the striking behavior of the surplus component of net worth, which is discussed on page 99, below. The ratio of capital stock to total assets actually varies inversely with size, while the ratio of long-term debt does not show any consistent variation.

The ratio of net worth to total assets is decidedly lower among deficit than among income corporations. The SEC data on net worth compared with total debt, grouped into several profitability classes, also show the same relationship, which is found to be statistically significant. Further examination reveals that the surplus component of net worth is the basis of this behavior, just as in the case of the variation with corporate size. There is a significant rank correlation between the profitability of minor industrial divisions and the net worth/total assets ratio; this correlation indicates that the effect of profitability upon net worth is sufficient to be a factor in determining industrial differences in the ratio. However, differences in the profitability of various size

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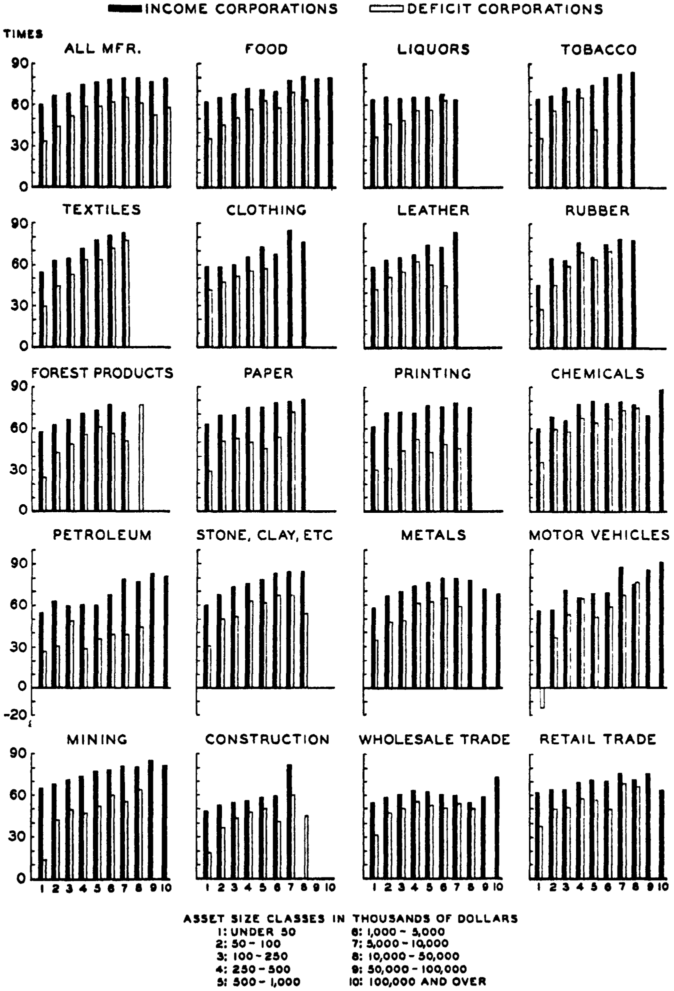
[2] The test was made with data for the ratio of net worth to total debt, which would, of course, give the same results as the net worth/total assets ratio.

[3] This tendency is stronger, however, among corporations with assets of less than $1,000,000 than among larger concerns. In fact, the SEC data for the ratio of net worth to total debt, which relate primarily to corporations with assets over $1,000,000, do not exhibit statistically significant variations with corporate size.

Chart 13—Ratio of Net Worth to Total Assets for Income and Deficit Groups of Major Industrial Divisions, 1937, by Asset Size*



*Based on Table C-15 in Data Book (National Bureau of Economic Research). Wholesale and retail trade figures are for the year 1938.

classes within the major industrial divisions do not appear to exercise a similar effect upon the net worth/total assets ratio.

THE COMPOSITION OF NET WORTH

Is the distribution of net worth between capital stock and surplus related to industrial, size, and profitability differences among corporations? We must admit at the outset that to treat capital stock and surplus as if they were two independent components of net worth is to some extent an artificial procedure. Stock dividends, revaluations, and the sale of stock at a premium all contribute to the uncertainty of the significance of the division of net worth into two components, as well as of the meaning of the total.[4] Other adjustments entering into the surplus reconciliation also render the figures ambiguous. The analysis of the sources and uses of corporate funds is far more effective in dealing with such problems than a cross-section analysis of the present type. In the present discussion it will be best not to think of capital stock and surplus as a measure of sources of funds for corporate outlays but as two formal categories in an accounting sense.

Industrial Variations

Both absolutely and relatively surplus varies more widely than capital stock among the minor industrial divisions. Surplus, with a median value of 25 percent of total assets, varies from 6 to 52 percent. Capital stock, with a median value of 48 percent, varies from 28 to 66 percent. (See Table C-28 in Data Book.) While the absolute range of the ratios for both these items is large, it should be remembered that the two items comprise a substantial portion of total liabilities; accordingly, their range of variation, when compared with that of other liabilities, is moderate. There is little evidence that capital stock and surplus act as substitutes in the corporate balance sheet. Only a very mild tendency exists, more pronounced among deficit than among income corporations, for a high percentage of capital stock to be associated with a low percentage of surplus and vice versa. Nevertheless, the ratio of capital stock to surplus varies from 62 to 567 percent, with a median value of 193 percent[5] (Table C-28 in Data Book).

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[4] The Internal Revenue data provide only one figure for "surplus and undivided profits." The SEC data go into greater detail, separating surplus into capital surplus, earned surplus, unsegregated surplus, and surplus reserves. Earned surplus for all listed corporations is 54 percent of total surplus. The figure for earned surplus is also affected by various adjustments which render its interpretation difficult. See *Statistics of American Listed Corporations*, p. 212.

The capital stock/total assets ratio varies among the minor industrial divisions in a fairly random fashion; that is, the variation does not reflect specific industrial characteristics. The correlation between the rankings of income and deficit corporations is only mildly significant. Division of minor industrial groups into producers' and consumers' goods industries does not yield significant results. Also, the industrial variations of the ratio show no relation whatever to the average asset size or to the profitability of the minor divisions.

The industrial variations in the ratio of surplus to total assets are, for the most part, no more systematic than those of capital stock. The correlation between the rankings of income and deficit corporations is not significant; and classification according to producers' and consumers' goods also yields no significant results. However, the surplus component reflects significant differences in asset size and profitability among the minor industrial divisions. The larger the average asset size, the higher the proportion of surplus. Similarly, the more profitable the industrial division, the greater the ratio of surplus to total assets. How much of the variation is attributable independently to size and how much to profitability is not shown by the simple correlation coefficients used in this study. The fact that there is little correlation between average asset size and industrial profitability, however, indicates that both factors exert independent influence on the surplus/total assets ratio. The rank correlation between profitability and the ratio of surplus to total assets is only moderately strong, and numerous industries of relatively high profitability have relatively low surplus components. This is probably more true of any single year than of a period of years, since sooner or later the effect of profitability on surplus should be felt.[6]

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[5] Mining and quarrying "not elsewhere classified" and all the trade groups with extremely high ratios have been excluded from this range.

[6] Unfortunately, a comparison of 1937 results with earlier years is not possible. In 1937, the item "other liabilities" was reclassified, which resulted in the shifting of surplus reserves from "other liabilities" into "surplus." See *Statistics of Income for 1937*, Part 2, p. 23.

Variations with Corporate Size

Both capital stock and surplus show systematic variations with size of corporation in a majority of industrial divisions. The ratio of capital stock to total assets declines as size of corporation increases; among the income corporations, however, most of the decline is confined to corporations of less than $1,000,000 total assets (Table C-13 in Data Book). The surplus/total assets ratio rises sharply and consistently among deficit concerns and among income corporations with assets of less than $1,000,000 (Table C-14 in Data Book).

The variation of the surplus component dominates the relationship between net worth and corporate size. The movement of the capital stock/total assets ratio appears to be largely in the nature of a compensatory or passive adjustment to the variation of surplus. There is no theoretical basis for expecting capital stock to be a smaller component of total liabilities among the large corporations; if anything, the contrary might be expected, because of the greater ease for large corporations to float securities and their tendency to avoid short-term debt. Perhaps one explanation is that small corporations capitalize their surplus more rapidly.

What is the basis for the sharp increases in the surplus component among corporations with total assets of less than $1,000,000? In the case of the deficit corporations, the answer appears clearly to be the sharp rise in the rate of profit (decline in the rate of loss). The enormous deficits of the unprofitable corporations with assets under $250,000 dominate the upward sweep of the surplus/total assets ratio and in turn of the ratio of net worth to total assets. This is an outstanding case of the interaction between corporate size and profitability. The basis of the increase in the ratio of surplus to total assets among income corporations with assets of less than $1,000,000 is less clear, since the rate of profit in most industrial groups actually declines slightly as size of corporation increases. The comparatively small surplus among the small corporations of the income group may reflect the greater instability of earnings and possibly a relatively shorter life, on the average, of small enterprises.

In connection with variations in the surplus component, the relation between corporate size and the reinvestment of earnings is of interest.[7] The data reveal that the proportion of net profits retained in 1937 actually declines as size of corporation increases, the small corporations plowing back a larger percentage of earnings than the large concerns in corresponding industrial groups.[8] These data, therefore, do not explain the behavior of the surplus/total assets ratio, although we should add that the variations with size of the ratio of cash dividends to net profit may be somewhat misleading, since among smaller corporations part of the salaries paid out should properly be included in profits. An estimate of salary payments cannot be made from the data available. The inclusion of such payments, however, would undoubtedly tend to reduce the disparity between the rate of reinvestment of earnings in small and large corporations, since adding part of salaries paid out to both numerator and denominator would raise the ratio of cash dividends to net profit.

Variations with Profitability

As in the case of size variation, the difference in the capital stock/total assets ratio between income and deficit corporations appears to be linked directly with the behavior of surplus. Particularly among the small and medium-sized corporations with assets under $10,000,000 the surplus component is much smaller in the deficit than in the income group, and the capital stock component is proportionately higher. For the very large concerns, in which the disparity between the surplus/total assets ratio of income and deficit corporations is narrow, the ratio of capital stock to total assets is only slightly lower among the deficit than among the

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[7] Data on the ratio of cash dividends to net profit or loss (less total tax) were obtained from the *Source Book of Statistics of Income for 1937.*

[8] The ratio of cash dividends to net profit or loss (less total tax) for all manufacturing corporations in 1937 is as follows:

Size Class	*Income Corporations*	*Deficit Corporations*
Under $50,000	64.2%	1.3%
50,000–100,000	67.9	3.6
100,000–250,000	72.9	3.7
250,000–500,000	74.2	5.3
500,000–1,000,000	72.6	7.3
1,000,000–5,000,000	74.2	11.3
5,000,000–10,000,000	76.6	18.2
10,000,000–50,000,000	84.4	24.3
50,000,000–100,000,000	93.1	34.7
100,000,000 and over	90.2	79.6

income concerns. Taking all manufacturing corporations as a whole, the higher ratio of capital stock among deficit compared with income corporations (52 percent and 46 percent, respectively) reflects the weight of the small and medium-sized corporations. Among the minor industrial divisions the differences in the proportion of capital stock between income and deficit corporations are also related to the fact that the deficit corporations are smaller than the corresponding income corporations. For those deficit corporations whose ratio of capital stock to total assets is higher than that for income corporations, total assets apparently have shrunk while the book value of outstanding capital stock has not been reduced proportionately, if at all.

LONG-TERM DEBT

Industrial Variations

In 1937 the long-term debt of nonfinancial corporations was twice the size of short-term debt in the form of notes and accounts payable and 56 percent of the outstanding capital stock. The figure was strongly affected by the great volume of long-term debt of the railroads and public utilities; in manufacturing and trade, the long-term debt was much less important. For manufacturing corporations it amounted to 67 percent of notes and accounts payable and 19 percent of capital stock; in trade, the respective percentage figures were 24 and 16.

Among the minor industrial divisions the ratio of long-term debt to total assets ranges from 1 to 36 percent, with the central half of the distribution lying between 5 and 10 percent. (See Table C-28 in Data Book.) The rankings of income and deficit corporations are very similar—an indication of fairly persistent industrial differences. The industrial rankings for 1937 and 1931 also are very similar, which would be expected since the short-run changes in the volume of long-term debt are bound to be relatively small. The long-term debt ratio is higher on the average among industries manufacturing producers' goods than among consumers' goods industries, but the variation within the two groups is so great that the difference is not statistically significant.

Differences in the average asset size of minor industrial groups do not affect the relative volume of long-term debt. Among these groups the relationship between profitability and the percentage of long-term debt is slightly inverse, but it is barely above the level of statistical significance.

The relationship between the ratio of fixed capital assets to total assets and the ratio of long-term debt to total assets is moderately direct among the minor industrial divisions. On the basis of the SEC data industrial differences in the ratio of long-term debt to fixed assets are statistically significant, a fact which yields further evidence of the existence of a relationship between long-term debt and fixed capital assets.[9]

Do long-term debt and short-term debt act as substitutes for each other among the various minor industrial divisions? An analysis of the rank correlations of the ratios of long-term and short-term debt to total assets indicates no statistically significant relationship, inverse or direct. The same absence of a substitute relationship, on an industrial basis, is found to characterize long-term debt and capital stock.

Variations with Corporate Size

The relationship of corporate size and the proportion of long-term debt to total assets differs between income and deficit corporations. In the former group size is not a significant factor. Among the deficit corporations as a whole, however, the ratio rises appreciably as corporate size increases (Table C-12 in Data Book), although a number of major industries do not conform to the general pattern. Moreover, the increases are not important among corporations with total assets of less than $1,000,000, so that the tendency might better be described as a difference in the level of long-term debt between corporations with assets of less than $1,000,000 and those with assets in excess of $1,000,000.

The ratio of notes payable to long-term debt (and also the ratio of notes and accounts payable to long-term debt) declines sharply as size of corporation increases (Table 10). This does not indicate, however, that long-term debt substitutes for short-term debt, since, as noted above, long-term debt does not increase with corporate size, except among the deficit corporations and then only in an irregular fashion. Long-term debt as a percentage of net worth shows no significant relationship to corporate size until corporations with total assets of more than $1,000,000 are

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[9] See *Statistics of American Listed Corporations*, Table 95, p. 320.

Table 10—RATIO OF SHORT-TERM DEBT TO LONG-TERM DEBT, OF LONG-TERM DEBT TO NET WORTH, AND OF LONG-TERM DEBT TO FIXED CAPITAL ASSETS, FOR INCOME AND DEFICIT DIVISIONS OF ALL MANUFACTURING CORPORATIONS, 1937, BY ASSET SIZE[a]
(in percent)

Size[b]	*Notes Payable to Long-Term Debt*		*Notes and Accounts Payable to Long-Term Debt*		*Long-Term Debt to Net Worth*		*Long-Term Debt to Fixed Capital Assets*	
	Income	Deficit	Income	Deficit	Income	Deficit	Income	Deficit
Under $50,000	163.7	137.6	534.5	388.9	8.6	33.7	16.1	30.9
50,000–100,000	156 3	133.9	427.6	342.5	8.0	22.7	15.7	26.2
100,000–250,000	142.2	134.0	354.5	300.4	8.2	20.4	16.2	25.2
250,000–500,000	127.0	108.0	295.5	221.0	7.9	19.0	16.3	25.8
500,000–1,000,000	120.0	93.7	278.1	189.6	7.0	20.8	14.5	28.3
1,000,000–5,000,000	100.0	65.2	228.9	129 2	7.2	23.7	15.3	33.8
5,000,000–10,000,000	56.5	29.5	141.4	66.7	8.6	29.1	18.8	39.1
10,000,000–50,000,000	45.9	26.2	117.2	80.3	9.6	30.0	20.5	37.9
50,000,000–100,000,000	20.6	13.4	78.7	24.3	15.6	64.3	31 6	65.4
100,000,000 and over	31.2	25.2	143.5	72.0	10.0	38.8	19.8	50.3

[a] Based on data from *Statistics of Income for 1937*, Part 2.

[b] Inclusive of the lower limit and exclusive of the upper.

reached, when the ratio begins to rise appreciably. The ratio of long-term debt to fixed capital assets varies irregularly with size, but its level among corporations with assets over $1,000,000 is definitely higher than among smaller concerns. A test of SEC data for the ratio of long-term debt to fixed capital assets reveals no significant variation with size, however; these data relate primarily to large manufacturing corporations with assets over $1,000,000.

Variations with Profitability

The ratio of long-term debt to total assets is considerably higher among deficit than among income corporations in corresponding asset classes and minor industrial groups. The differences tend to increase with size of corporation because of the sharp rise of debt among the deficit concerns. Since deficit corporations also have a larger proportion of current liabilities, the higher ratio for long-term debt cannot be interpreted as a substitution of long-term for short-term obligations. For the most part it appears to reflect a shrinkage in the assets of deficit corporations without a corresponding shrinkage in the long-term debt. In other words, it reflects the difference between the surplus components of income and deficit corporations.

As indicated above, no correlation exists between profitability and the level of long-term debt among minor industrial groups. Among the size classes of the major industrial groups, also, no relationship is evident between the variations of long-term debt and profitability. In addition, the SEC data show no significant variation with profitability in the ratio of long-term debt to fixed assets.

The Frequency of Long-Term Debt

Since a corporation has no inherent need for any long-term indebtedness, it is interesting to know what types of corporations rely more or less frequently upon this source of funds. Data from *Statistics of American Listed Corporations* indicate that among corporations with assets of more than $1,000,000 the proportion of concerns having funded debt increases with corporate size in a consistent fashion (Table 11). A distinction should be drawn, however, between funded debt and "other long-term debt," which

Table 11—PERCENTAGE OF LISTED MANUFACTURING CORPORATIONS HAVING LONG-TERM DEBT, AND THE RATIO OF FUNDED DEBT TO OTHER LONG-TERM DEBT, 1937, BY ASSET SIZE[a]

Size[b] (in millions)	*Proportion of Corporations Having Funded Debt*	*Proportion of Corporations Having Other Long-Term Debt*	*Proportion of Corporations Having Funded Plus Other Long-Term Debt*	*Ratio of Funded Debt to Other Long-Term Debt*
Under $1	6.0	30.2	33.6	23.7
1– 3	8.6	27.8	33.3	102.6
3– 5	21.2	25.8	38.6	240.2
5– 10	23.1	33.1	44.4	244.5
10– 20	26.3	24.8	42.6	311.5
20– 50	30.8	24.2	44.2	979.7
50–100	37.5	31.3	56.3	335.1
100–200	47.1	29.4	55.9	1,776.9
200–500	61.9	66.7	76.2	890.9
500 and over	70.0	70.0	80.0	275.4

[a] Based on data, as of December 31, 1937, from *Statistics of American Listed Corporations*, Part I, Table 64, pp. 226-45.

[b] Inclusive of the lower limit and exclusive of the upper.

is in the form of mortgages for the most part.[10] The proportion of corporations having other long-term debt of a non-funded variety declines slightly until corporations with assets of over $200,000,000 are reached, after which the proportion rises sharply. This rise may be due to the importance among the largest corporations of term loans, oil land purchase obligations, and other purchase obligations. Among the smallest corporations funded debt forms a lower proportion of total assets than other long-term debt; but for corporations with assets in excess of $1,000,000 funded debt is the higher of the two items.

Table 12 reveals that the relative frequency of funded debt varies considerably among industries with assets of more than $1,000,000. Utilities have the highest proportion, and extractive industries the lowest, of the main industry groups. Within manufacturing the frequency varies from a high of 48 percent in iron and steel to a low of 10 percent in textiles. The frequency of other long-term debt, largely mortgages, is higher on the whole and its range is narrower than that of funded debt. A comparison of the first two columns in Table 12 indicates the relative importance of funded debt and what may be presumed to be mortgage debt. In trade, particularly, the frequency of mortgage debt is much greater than the frequency of funded debt.

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[10] "Other long-term debt" is defined to include mortgage loans and notes with a maturity of one year or more. Mortgage bonds, collateral bonds, debentures, equipment trust obligations, and long-term notes of the bond category are included in funded debt. Funded debt coming due within one year is excluded from this category. See the explanatory notes, *Statistics of American Listed Corporations*, p. 181.

Table 12—PERCENTAGE OF LISTED CORPORATIONS HAVING LONG-TERM DEBT, 1937, BY INDUSTRIAL GROUPS[a]

Industry	*Proportion of Corporations Having Funded Debt*	*Frequency of Other Long-Term Debt*	*Proportion of Corporations Having Funded Debt and/or Other Long-Term Debt*
All corporations	24.2	31.2	43.8
All manufacturing	21.4	29.3	41.4
Food	30.3	24.2	44.4
Tobacco	19.0	9.5	23.8
Beverages	17.9	37.5	44.6
Textiles	10.2	22 0	28.8
Lumber	25.0	37.5	50.0
Paper	47.2	41.7	66.7
Printing and publishing	29.2	45.8	50.0
Chemicals	14.7	30.7	40.0
Petroleum refining	39.5	60.5	65.8
Rubber	23.5	41.2	52.9
Leather	16.7	11.1	22.2
Building materials	25.5	23.6	41.8
Iron and steel	48.0	32.0	62.0
Nonferrous metals	27.8	30.6	52.8
Machinery and tools	16.3	24.2	33.7
Transportation equipment	11.8	29.2	36.6
Merchandising	15.4	47.9	51.5
Chain stores	12.0	53.0	55.4
Department stores	31.6	55.3	63.2
Extractive	10.1	21.1	25.9
Utilities	95.9	47.3	98.6

[a] Based on data, as of December 31, 1937, from *Statistics of American Listed Corporations*, Part I, Table 63, pp. 212-23.

Little information is available on the frequency of long-term debt among corporations with assets under $1,000,000. A study of a sample of 1,300 small manufacturing firms with assets of less than $250,000 showed that in 1936 only 26 percent of these corporations had bonds or mortgages.[11] This percentage figure may be contrasted with 41 percent for manufacturing corporations with assets of more than $1,000,000 (Table 12). Very likely the small concerns have not only a lower proportion of long-term debt but also a lower frequency of this type of liability.

Some further light is thrown on the relative frequency of different types of long-term liabilities by certain SEC data, which define four types of "capital structure" (Table 13). The most frequent type consists of common stock only, found predominantly among corporations of the smallest average size (i.e., those with assets under $1,000,000), which own only 15 percent of the assets of all listed corporations.

Table 13—TYPES OF CAPITAL STRUCTURE, ALL LISTED CORPORATIONS, 1937[a]

Capital Structure	*Frequency*	*Percent of Total*	*Average Assets* (millions)	*Average of Net Profit per Dollar of Net Worth*	*Ratio of Fixed Assets to Total Assets*
Common stock only	801	46	$12	$9.56	47.7
Common and preferred stock; no funded debt	510	29	21	10.56	36.3
Common stock and funded debt	144	8	55	5.13	58.2
Common stock, preferred stock, funded debt	286	17	129	6.52	58.6

[a] Based on data, as of December 31, 1937, from *Statistics of American Listed Corporations*, Part I, Table 51, p. 188, and Table 70, p. 294.

Table 13 shows that the complexity of capital structure is related to the average asset size of corporations, the complexity growing as average size increases. The table also indicates that the absence of funded debt is associated with a relatively high level of profitability. This relationship may possibly reflect particular industrial or size differences as well as profitability, but the available data do not permit a determination of this point.

Corporations with funded debt have a relatively high ratio of fixed capital assets to total assets, reflecting no doubt the presence of a number of utility corporations in the sample. Reasons for the difference between the ratio of fixed capital assets for corporations with common stock only and that for corporations with both common and preferred stock are not clear.

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[11] Charles L. Merwin, Jr., *Financial Characteristics of American Manufacturing Corporations*, Temporary National Economic Committee, Monograph No. 15 (Washington, 1941) pp. 110-12. Five industries were sampled: baking, men's clothing, furniture, stone and clay, and machine tools.

INVESTED CAPITAL AND CAPITAL ASSETS

One of the most pervasive features of balance-sheet structure is the margin by which invested capital (net worth plus long-term debt) exceeds fixed capital assets. Only a few classes of deficit corporations do not show this margin. That some non-current sources of funds are employed for the financing of current assets is roughly indicated by the degree to which current assets exceed current liabilities, as measured by the current ratio.[12] A complementary measure showing the margin between fixed capital assets and invested capital is provided by a ratio between the two items.

Among the minor industrial groups, the ratio of invested capital to fixed capital assets varies from 1 to 11 times, with a median value of 2; the central half of the distribution lies between 2 and 3 (Table C-28 in Data Book). A considerable degree of stability in these industrial differences is indicated by a high rank correlation between income and deficit corporations. No strong connection between industrial types and the size of the ratio is discernible, however, and a test reveals no significant difference between the mean ratio of the producers' and consumers' goods industries.

The ratio rises moderately, but not regularly, with corporate size—particularly among deficit concerns. (See Table C-26 in Data Book.) The tendency for less of the long-term funds to be used to finance long-term fixed capital requirements as corporate size increases indicates that a progressively large proportion of the funds goes to finance intercorporate investments and current assets.

The ratio is consistently higher among income corporations than among deficit corporations, indicating, like the current ratio, that income corporations employ a larger proportion of their long-term liabilities for current purposes. Part of the difference may also be attributable to the decrease in the surplus component of deficit corporations without a proportionate decrease in the valuation of fixed capital assets.

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[12] This statement is not meant to imply a direct connection between a given source and a given use of funds, but merely to indicate that a part of the current assets must, in the final analysis, be financed by non-current funds.

Appendix A

CHARACTERISTICS OF THE DATA

THE MOST SUITABLE DATA for a cross-section analysis of financial structure consist of statements of individual concerns, which can be combined and classified in various appropriate ways for the testing of hypotheses. Such data, however, are available at present only on a sample basis with limited coverage. For a more extended coverage of industries and size classes it is necessary to forego some refinements in the quality of the data, to deal with aggregate figures for groups of corporations rather than with observations for individual concerns, and to be content with broad comparisons of the financial structure of different classes of business enterprise.

The balance-sheet data used in the present study are unadjusted; that is, they reflect the fact that the dollar value of certain assets on the one hand and of net worth on the other represent an appraisal by the management. To the extent that revaluations of assets have been made, the dollar values recorded in the balance sheet are not completely accurate summations of the past net flows of funds into and out of various accounts. For example, when we compare the ratio of fixed capital assets to total assets of various industrial groups, we must recognize that we are not necessarily comparing data representing actual dollars spent in every case. Nevertheless, we are concerned with comparative features of financial structure rather than with absolute measurements, and it is highly doubtful whether revaluations of the type mentioned would affect the broad comparisons in which we are interested.

For several reasons the year 1937 has been selected as the focus for the present study: for one thing, the statistics for 1937 provide a detailed breakdown of current liabilities, permitting a separate analysis of notes payable, accounts payable, and "other liabilities" (defined to include primarily accrued liabilities); also, our analysis is intended to serve, among other things, as a benchmark with which to compare data on the financial structure of years in previous decades which represent relatively high levels of business activity. But since conclusions based on 1937 data may be affected by short-run changes in financial structure, they have been compared, so far as possible, with the results for 1931.[1] Detailed examination of each year from 1931 to 1937 would have been too lengthy; therefore, the two terminal years of this comparatively short period were selected for comparison. In so far as business cycles affect relationships among industry, size, and profitability classes, part of the differences between 1931 and 1937 may be attributable to the fact that they reflect different phases of the cyclical process. Study of a longer period than 1931-37 would be necessary, however, for an adequate cyclical analysis.[2]

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[1] Limitations of space prevent publication of the tabulations in the present volume. The 1931 data are available in the files of the National Bureau of Economic Research, Financial Research Program. The 1937 data are included in the Data Book, described in Chapter I, p. 2, fn. 1.

SOURCES OF DATA

The chief sources of comprehensive data which we have used for our study are the compilations of the Bureau of Internal Revenue, which are made available annually in *Statistics of Income* and in the unpublished *Source Book of Statistics of Income. Statistics of Income for 1937*, Part 2 (1940), provides a fairly detailed balance-sheet and income statement for all corporations, classified by asset size into ten groups, by industry into a number of so-called major divisions, and by profitability into two broad groups, corporations "with net income" and "with no net income." A more detailed breakdown of balance-sheet items and a finer industrial classification are provided by the Bureau's *Source Book of Statistics of Income for 1937*, an unpublished manual tabulation of which one copy is available at the Bureau's Washington office. In *Statistics of Income for 1938*, Part 2 (1941), the major industrial classifications were considerably refined and somewhat altered, making possible a classification by size for a larger number of groups than in 1937, particularly in retail trade and in industries formerly classified under metals.

The statistics are tabulated in classifications suitable for a cross-section analysis of corporate capital and credit structure, but it must be emphasized that within each cross-classification or "cell" the data consist of composite or aggregate balance sheets and throw no light upon the dispersion or frequency distribution of individual corporations within cells. For information on this subject we have used a supplementary body of data, showing the dispersion of various balance-sheet ratios *within* classes of corporations. These data were published in *Statistics of American Listed Corporations*, Part 1, issued in 1940 by the Securities and Exchange Commission; and they have been supplemented by several unpublished tabulations prepared by the Securities and Exchange Commission at the request of the National Bureau of Economic Research. Although the SEC statistics are limited to "large" corporations, their value lies in the fact that they are in the form of frequency distributions, which permits us to test the statistical significance of differences between the mean values of ratios of different classes of corporations.

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[2] Companion studies in the present series will throw light on the long-term changes in the comparative financial structure of corporations of different size groups and industrial composition. See National Bureau of Economic Research (Financial Research Program), *The Financing of Large Corporations, 1920-39*, by Albert R. Koch, (1943); *Changes in the Financial Structure of American Business Enterprise, 1900-1940*, by Sidney S. Alexander (ms. 1945).

THE INTERNAL REVENUE DATA

In a form suitable for cross-classification by industry, size, and profitability, the Internal Revenue data are available beginning with the year 1931.[3] Since that year, the tabulations have undergone several important changes, particularly with respect to industrial classification and the segregation of particular balance-sheet accounts. In 1934 a shift from a consolidated to a non-consolidated basis for reporting financial statements also affected the balance-sheet structure.

In the present study each of the following asset and liability accounts, which are available in *Statistics of Income for 1937*, has been studied individually and, in certain cases, in combination:

Assets

Cash
Investments, government obligations
Notes and accounts receivable (net)
Inventory
Investments, other than government obligations
Capital assets (net)
Other assets

Liabilities

Accounts payable
Bonds, notes, mortgages payable:
  Maturity less than 1 year
  Maturity 1 year or more
Capital stock
Surplus and undivided profits (less deficit)
Other liabilities

Corresponding to the balance-sheet data is a full income account, of which the gross sales and net profit are basic to the analysis.

Industrial Classification

The *Source Book of Statistics of Income* of the Bureau of Internal Revenue classifies corporations into a large number of so-called minor industrial divisions, of which we have selected 61 for comparison.[4] The corporations are grouped as follows:

Manufacturing: 47 divisions
Trade: 5 divisions
Construction: 2 divisions
Shipbuilding: 1 division
Mining and Quarrying: 6 divisions

The detailed industrial comparisons that we have made omit several major branches of the economy. Agricultural corporations have been excluded because they do not represent the typical agricultural enterprise and are unimportant quantitatively. Transportation and public utilities have not been included primarily because little interest attaches to an analysis of their current assets and liabilities, while their size range is too narrow to make for fruitful comparisons. Financial corporations (holding companies, banks, insurance companies, real estate companies, stockbrokers, etc.) have such characteristic financial structures that comparison with the cross-section financial structure of manufacturing and trade appears farfetched. Finally, service corporations have been omitted because they are too heterogeneous to treat as a whole, while a detailed treatment of their separate branches would have proved cumbersome.

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[3] When the present study was started, the year 1937 was the most recent year for which data were available. The Internal Revenue data are published with a lag of approximately three and one-half years after date of filing.

[4] The 61 minor industrial divisions, which include 15 divisions of retail trade, are listed in Appendix E. *Statistics of Income for 1938* provided the detailed breakdown of retail trade, which was formerly unavailable.

Within the sphere chosen for industrial comparisons the only deficiency in coverage is in the field of retail trade, in which unincorporated concerns are important. Nevertheless, the Internal Revenue data for 1937 include approximately 70,000 retail trade corporations, which should provide a representative picture of that branch of enterprise, apart from any differences that may exist between incorporated and unincorporated companies in corresponding classes.

Size Classification

The aggregate dollar figures for each balance-sheet item are grouped by corporate size according to the following total assets classes:[5]

Class 1—Under $50,000
Class 2—50,000-100,000
Class 3—100,000-250,000
Class 4—250,000-500,000
Class 5—500,000-1,000,000
Class 6—1,000,000-5,000,000
Class 7—5,000,000-10,000,000
Class 8—10,000,000-50,000,000
Class 9—50,000,000-100,000,000
Class 10—100,000,000 and over

The industrial cross-classification available for the analysis of size variations within industries is less detailed than that described in the preceding section. It consists of 19 "major" industrial groups of which the 61 "minor" industries are components.[6] The major groups are divided into the ten asset classes listed above and also into corporations with and without net income as defined for tax purposes.

Profitability Classification

The basic profitability classification of the Internal Revenue data divides corporations into those with and without net income, which we have called

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[5] These classes are inclusive of the lower limit and exclusive of the upper. For convenience we have numbered each class interval, and we have referred to them as "Class 1," "Class 2," etc. When Classes 8, 9, and 10 include only a few concerns, these data are combined by the Bureau of Internal Revenue to conceal the identity of individual corporations. As a result, Classes 9 and 10 are rarely given separately, even where corporations of that size occur. Thus there are in effect eight size classes.

[6] For a list of the 19 "major" industries that are cross-classified by size, see Appendix E.

"income" and "deficit" corporations, respectively. Net income is defined as net income for excess profits tax computation, that is, it is net of all taxes except income and excess profits taxes. The balance-sheet ratios of income and deficit corporations can be compared for each *minor* industrial division, and for each size group within the *major* industrial divisions.

A supplementary analysis of the relationship between profitability and various balance-sheet ratios is made possible by the fact that a profit ratio can be computed for each minor industrial division and for each size class within the major industrial divisions. This profit ratio indicates whether certain variations between industrial divisions or size classes may be related to profitability differences. For these purposes profitability is measured by the ratio of net income to net worth. Other indices of profitability can be thought of, but they probably would not yield different results in the present connection.[7]

Further Characteristics of the Data

For an analysis of the type here made, the data of the Bureau of Internal Revenue have certain limitations.[8] The *Statistics of Income* computations do not provide a universal coverage of the balance sheets of all corporations. In 1937, 7 percent of all manufacturing corporations and 12 percent of all corporations filing income tax returns did not submit balance sheets. These are the smaller concerns, however, whose sales in preceding years had amounted to only 1 or 2 percent of the total. A minor statistical problem arises in using *Source Book* data, since the sales and income figures refer to a larger number of corporations than the balance-sheet data. In this case, also, the corporations with the missing balance sheets are the smaller ones.[9]

The Bureau of Internal Revenue assigns to corporations their industrial classification according to their predominant activity. A decline or increase in the volume of one line of activity may cause a shift in the corporation's classification from one year to the next. However, the fact that a concern which produces a diversified output must be classified in one industry or another cannot be considered a defect of the data but is actually a problem in the definition of "industry."[10]

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[7] It is true, however, that profitability comparisons between small and large concerns are rendered somewhat ambiguous by the complete exclusion from net income of officers' compensation. On this problem see W. L. Crum, *Corporate Size and Earning Power* (Cambridge, Mass., 1939), and Charles L. Merwin, Jr., *Financial Characteristics of American Manufacturing Corporations,* Temporary National Economic Committee, Monograph 15 (Washington, 1941) Chapter 2.

[8] Consideration in any great detail of the quality of the Internal Revenue data for present purposes is not necessary here, since this ground has been covered thoroughly in earlier publications. See among others, R. C. Epstein, *Industrial Profits in the United States* (National Bureau of Economic Research, New York, 1934) pp. 455, 548-57; Solomon Fabricant, *Capital Consumption and Adjustment* (National Bureau of Economic Research, New York, 1938) p. 35; W. L. Crum, *op. cit.*, Chapter 2; Charles L. Merwin, Jr., *op. cit.*, pp. 2-5.

[9] See page 119 for a description of the way in which the sales and income data have been deflated for purposes of comparison with the balance-sheet data.

For the period 1931-37 the comparability of the results is affected not only by the institution of unconsolidated returns in 1934 but also by various redefinitions of industrial groupings. The majority of these changes of industrial definitions, however, were too minor to affect seriously the industrial comparisons made in this study. Minor redefinitions of income and deficit corporations have also produced some arbitrary shifts from one classification to the other.[11]

The dating of the balance sheets submitted may determine to some extent the importance of the various component items. Returns may be submitted for fiscal or for calendar years, which introduces an element of noncomparability, particularly in periods of rapid change in the general level of economic activity. By the same token, the comparison of industries that file on the same date but have different patterns of seasonal operations is less accurate.

The importance of these characteristics of the data should not be exaggerated. With the exception of the feature of unconsolidated returns, there is no reason to believe that they can account for any of the systematic behavior with industry, size, and profitability which may be found in capital and credit structure or obscure such behavior where it exists.[12] Furthermore, several of the limitations of the data apply to intertemporal comparability rather than to a cross-section analysis, and are therefore of secondary interest here. Accepting the fact that balance-sheet data inevitably involve some estimated valuations, the Internal Revenue data appear tolerably suited to our purposes.

SEC DATA ON LARGE CORPORATIONS

The most important feature of the SEC data, from the point of view of the present analysis, is the fact that they are in the form of frequency distributions of balance-sheet ratios which are classified according to industry, size, and profitability. With such information, an objective appraisal can be made of the significance of differences between the mean ratios of the various classifications, something which cannot be done with the aggregate figures provided by the Bureau of Internal Revenue. Such tests of significance have been made, as explained in Appendix B, by the analysis of variance. A further useful feature of the SEC data is the information provided on the frequency with which the various balance-sheet accounts appear in each classification. This information sheds some light on the question of whether the frequency as well as the proportion of marketable securities, intercorporate investments, and notes payable varies among different classes of corporations.

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[10] The limitation on filing consolidated returns imposed by the Revenue Act of 1934 simplified the composition of the output of individual concerns somewhat, but it may have resulted in a separation of corporate entities which, with respect to their financial characteristics, really should be considered together.

[11] For example, in 1936 income was redefined to include income from dividends and interest received on certain government obligations.

[12] The effect of the elimination of consolidated returns in 1934 is discussed in Appendix C.

The coverage of the SEC data is limited to 1,741 listed—and consequently large—corporations, of which 1,034 are in manufacturing. All data refer to December 31, 1937, or to the nearest fiscal year-end. In *Statistics of American Listed Corporations*, Part 1 (1940), frequency distributions of a number of ratios classified by industry, asset size, profitability, and several other factors are presented, but the threefold classification by size, industry, and profitability, which is the basis of our analysis of the Internal Revenue data, is not available. The Financial Research Program therefore suggested certain additional cross-classifications of the same frequency distributions, which were kindly provided by the SEC. Since these tabulations were derived from existent punch cards, no ratios in addition to those previously published were available. The tabulations were therefore confined to the following ratios:

Sales/inventory
Inventory/total assets
Cash, marketable securities, and receivables/total assets
Quick assets/current liabilities
Current assets/current liabilities
Fixed capital assets/total assets
Current liabilities/total liabilities
Long-term debt/fixed capital assets
Net worth/total debt
Sales/total assets

These ratios were cross-classified as follows:

1. By industry:
   a. All manufacturing corporations
   b. Machinery
   c. Transportation equipment
   d. Extractive industries
   e. Trade
2. By asset size (in millions):
   Under $1
   1– 3
   3– 5
   5– 10
   10– 20
   20– 50
   50–100
   100 and over
3. By profitability, according to the ratio of net income/net worth (in percent):
   Under −5.0
   −5.0– 0.0
   0.0– 5.0
   5.0–10.0
   10.0–15.0
   15.0–20.0
   20.0 and over

The requisite measures were then computed from the data within each cell created by this cross-classification.

Further tests of the significance of industrial differences were based upon frequency distributions published in *Statistics of American Listed Corporations*, Part 1. In this case, the data were not classified simultaneously according to size and profitability. The industries tested were subdivisions of manufacturing, as follows:

Food
Tobacco
Beverages
Textiles
Lumber
Paper
Printing and publishing
Chemicals
Petroleum refining
Rubber
Leather
Building materials
Iron and steel
Nonferrous metals
Machinery and tools
Transportation equipment

The results of the tests of significance are summarized as follows:

I. Significance of Differences in Ratios among the Subdivisions of Manufacturing

Ratio	*Result*[13]
Sales/inventory	Significant
Sales/receivables	Significant
Cash, marketable securities, and receivables/total assets	Significant
Quick assets/current liabilities	Significant
Current assets/current liabilities	Significant
Fixed assets/total assets	Significant
Long-term debt/fixed assets	Nonsignificant
Net worth/total debt	Significant
Sales/total assets	Significant

II. Significance of Variations of Ratios with Size and Profitability, Listed Manufacturing Corporations[14]

Ratio	*Variation with Size*	*Variation with Profitability*
Sales/inventory	Significant	Nonsignificant
Inventory/total assets	Nonsignificant	Nonsignificant
Cash, marketable securities, receivables/total assets	Nonsignificant	Significant
Sales/receivables	Nonsignificant	Nonsignificant
Quick assets/current liabilities	Significant	Significant
Current assets/current liabilities	Nonsignificant	Significant
Fixed capital assets/total assets	Nonsignificant	Significant
Current liabilities/total liabilities	Significant	Significant

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[13] R. A. Fisher's Z-coefficient was computed for this and the following tests. A 5 percent level of significance was employed throughout in appraising the results.

[14] The significance of the size and profitability classifications was tested only for manufacturing corporations as a whole, and not for any subdivisions or other branches of industry and trade.

Long-term debt/fixed assets	Nonsignificant	Nonsignificant
Net worth/total debt	Nonsignificant	Significant
Sales/total assets	Significant	Nonsignificant

DEFLATION OF SALES FIGURES FROM THE *SOURCE BOOK*

Unlike *Statistics of Income* the *Source Book* provides sales data for a larger number of corporations than that for which it provides balance-sheet data. Therefore, in computing ratios based upon sales data from the *Source Book*, the sales figures must be deflated.

The corporations for which both sales and balance-sheet data are given in *Statistics of Income* are the same, in each major industrial group, as those for which balance-sheet data are reported in the *Source Book*. The deflation was accordingly made as follows: The difference between the sales figure in the *Source Book* and that in *Statistics of Income* was obtained for each *major* industrial group. This difference was then multiplied by the ratio of the sales of each minor group to the total sales of the major group to which it belonged. The result was then subtracted from the sales of the relevant minor group as given in the *Source Book*. This correction does not take account of the fact that the average sales of corporations not reporting balance sheets may vary among the minor industrial groups.

INTERNAL REVENUE DATA FOR YEARS OTHER THAN 1937

As stated above, when the present study was inaugurated the classification of the Internal Revenue data by size and by minor industries, which is the basis of our analysis, was available only from 1931 to 1937, inclusive. Even within this short period temporal comparisons are limited by changes in the definition of balance-sheet items, in industrial classifications, and in the practice with respect to consolidated returns. The effects of discontinuing consolidated returns in 1934 are dealt with in Appendix C. We may consider here, briefly, the other two aspects of the problem. The remarks apply to a comparison of the years 1931 and 1937, for which a systematic comparison of results has been made, so far as possible.

The changes in industrial classification primarily affect the comparisons of ratios by size classes. In 1931 several major industrial groups were combined, thus making a detailed comparison with 1937 data impossible. The groups affected are chemicals and petroleum; automobiles and metals; textiles and wearing apparel. Each pair was combined in 1931 and listed separately in 1937. These shifts are distinct from any shifts of individual corporations caused by slight changes in their predominant field of activity.

Two important changes in the character of balance-sheet items make for non-comparability of the 1931 and 1937 data. In 1931 notes payable were combined with accounts payable; not until 1937 were the two accounts separated. Therefore, a comparison between 1931 and 1937 of the analysis of either account is impossible. The other important change was the separation in the year 1937 of surplus reserves and "other liabilities." "Other liabilities" in 1937 thus became almost entirely accrued items. This shift affects the comparability of surplus, net worth, other liabilities (i.e., accrued items), and finally the current ratio. (The current ratio was so defined in 1937 that other liabilities were included in current liabilities.)

Mention should also be made here of the use of the industrial breakdowns in *Statistics of Income for 1938*, Part 2 (1941), which became available during the course of this investigation. Of particular interest are the data for wholesale trade and the leading subdivisions of retail trade, in classifications by average asset size. In the Data Book,[15] the breakdowns of the data for wholesale and retail trade are presented by size classes (Tables C-1 to C-26); and the complete percentage composition of the balance sheet and other selected ratios are given for the leading subdivisions of retail trade (Table C-30).

SEASONAL FLUCTUATIONS IN BALANCE-SHEET DATA

Seasonal fluctuations in balance-sheet data introduce an element of uncertainty into the industrial comparisons of capital and credit structure. The variations of ratios with size and profitability, however, are unlikely to be substantially affected, as there is little reason to assume that the incidence of seasonality will vary appreciably with respect to these two categories. Increasing awareness of the seasonal character of balance-sheet components is indicated by the discussions of the so-called "natural business year" which have appeared in the last decade, culminating in the formation of a Natural Business Year Council.[16]

Availability of balance-sheet data based on the natural business year, however, would not completely eliminate the effect of seasonality upon balance-sheet comparisons, although it would reduce it. So long as the amplitude of seasonal fluctuations varied among industries, an accurate comparison of their balance-sheet structure would require monthly or at least quarterly data. Unfortunately, such data are lacking in any comprehensive form.

[15] See Chapter I, p. 2, fn. 2, for a complete description of the Data Book.

[16] In 1937, out of a total of 477,838 corporations 80,798 took advantage of the privilege of filing returns on a fiscal-year basis. Although no comparable figures on sales are available, the importance of fiscal-year returns may be estimated by the fact that these returns included 12 percent of the net income of income-earning corporations and 14 percent of the net deficit of deficit corporations.

Appendix B

ASPECTS OF THE CROSS-SECTION ANALYSIS OF FINANCIAL STRUCTURE

IN ORDER TO PROVIDE a general picture of the relative size of the balance-sheet components that we studied, all items were expressed as a percentage of total assets. In addition, items whose turnover is of great interest were related to the volume of sales; these items include the various current assets and liabilities, fixed capital assets, and total assets. The degree to which the pattern of financial ratios will differ according to the basis of comparison used may be indicated by a description of the behavior of the ratio of total assets to sales, with respect to industry, size, and profitability.

RATIO OF TOTAL ASSETS TO SALES

Among minor industrial divisions[1] the ratio of total assets to sales ranges from 31 to 345 percent.[2] The median value is 94 percent, while the central half of the distribution, bounded by the first and third quartiles, lies between 74 and 120 percent.[3] While the absolute range of the ratio is wide, the range when compared with other turnover ratios is moderate.

The variation of the total assets/sales ratio, of course, reflects the joint effects of numerous factors, including profitability, the length of the production process, the degree of vertical integration, the volume of investments in affiliates (i.e., non-operating assets), differences in the proportion of value added by production, etc. For example, trade corporations have a small percentage of total assets in relation to sales since their business consists in the distribution rather than in the processing of inventories. Another factor in the case of trade corporations is, no doubt, the seasonal nature of wholesale and retail sales. For such concerns, the end of the fiscal year usually coincides with the calendar year end and represents the low ebb of operations. Since inventory is a very substantial part of total assets, the ratio of total assets to sales as indicated by year-end data will be even lower than the average for the year as a whole. Low ratios of total assets to sales (i.e., high turnovers of total assets) are recorded also by packing house products, mill products, and clothing and apparel; while at the other end of the scale (low turnovers of total assets) are airplanes, locomotives and railroad equipment, sawmill products, chemicals proper, and petroleum and oil refinery products.

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[1] For a list of the minor industrial divisions studied, see Appendix E.

[2] Excluding mining and quarrying "not elsewhere classified," which has an exceptionally high ratio.

[3] See Data Book (described in Chapter I, p. 2, fn. 1), Table C-28.

When the minor industrial divisions are classified into "producers'" and "consumers'" goods, the ratios of total assets to sales for the two groups are found to be 112 and 74 percent, respectively.[4] These ratios indicate that the turnover of total assets is considerably lower among the producers' goods industries than among the consumers' goods. The producers' goods industries are those which, on the average, have a longer period of processing and a greater proportion of fixed capital assets to total assets. They also tend to be of somewhat larger average total asset size; as analysis shows, the turnover of total assets tends to decrease significantly as average asset size of the minor industrial divisions increases. This behavior is probably related to the greater degree of vertical integration among the large concerns (to be discussed below) and to the fact that the volume of nonoperating assets (investments in affiliates) is relatively greater among the large corporations.

Among the minor industrial divisions the ratio of total assets to sales shows no significant variation with profitability. It might be expected that the more profitable the concern the more rapid would be its turnover of assets; as between industries, however, this relationship is apparently obscured by the operation of other elements such as those mentioned above—average asset size, degree of vertical integration, and proportion of investment in affiliates.

The industrial rankings of the total assets/sales ratio show a high degree of similarity between income and deficit corporations, demonstrating that the level of profitability does not alter the relative industrial rankings. Also, a high degree of similarity between 1937 and 1931 in the rankings indicates that while the absolute level of the ratio varies with the general level of business, the relative positions of different industries are fairly well maintained over short periods.

The variations of the total assets/sales ratio with size of concern, which are illustrated in Chart B-1, are of great interest, since they indicate how different the variations in size structure will be as the basis of comparison is changed. For every major industrial division[5] and for both income and deficit concerns the ratio rises as size of corporation increases. The difference in the turnover of small and large concerns is impressive, as is the substantial degree of consistency with which the ratio rises from size class to size class.

The consistent rise is explained by the behavior of the turnover of the major asset components. Two general points may be noted. (1) As size of corporation increases intercorporate investments expressed as a percentage of total assets rise substantially and thus contribute toward the rise in the total assets/sales ratio, since these assets (i.e., intercorporate investments) are of a nonoperating character. (2) The decreased turnover of inventory

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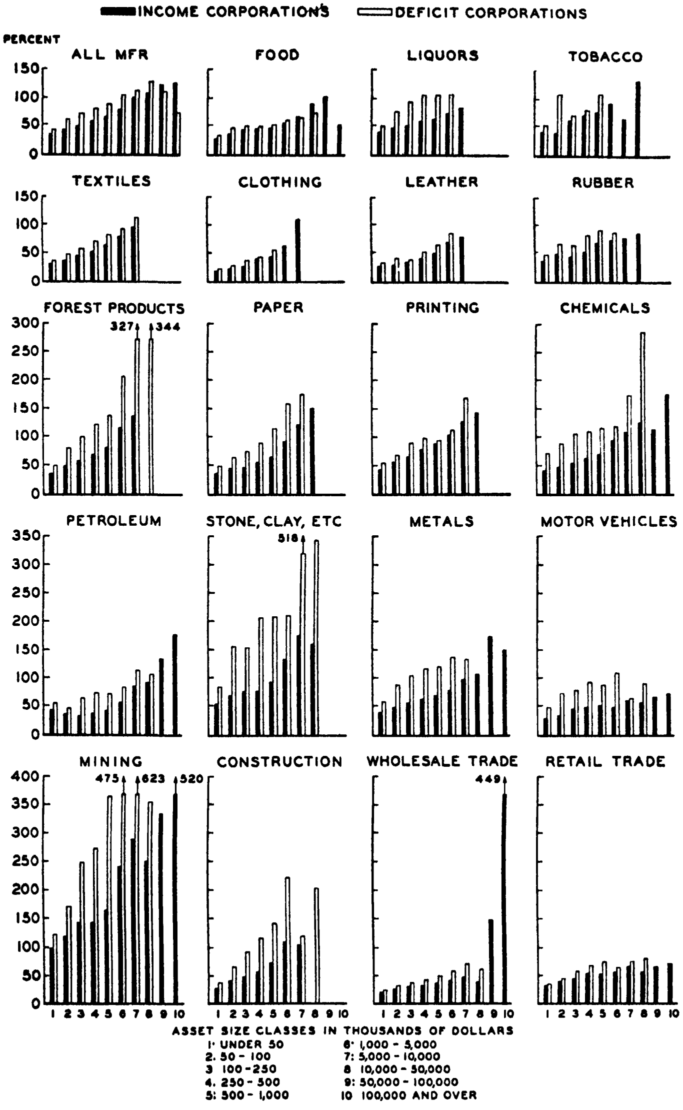
[4] See Appendix E for the classification into producers' and consumers' goods.

[5] For a list of the groupings by major industries, see Appendix E.

Chart B-1—RATIO OF TOTAL ASSETS TO SALES FOR INCOME AND DEFICIT GROUPS OF MAJOR INDUSTRIAL DIVISIONS, 1937, BY ASSET SIZE*



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* Based on Table C-16 in Data Book (National Bureau of Economic Research). Wholesale and retail trade figures are for the year 1938.

and fixed capital assets, as size of corporation increases, appears to be due to the greater degree of vertical integration found in large, compared with small, corporations. To appreciate the importance of this factor it is only necessary to think of the vertically integrated concern as an amalgamation of a group of firms formerly operating independently at various stages of the productive process. The integrated unit has the total assets of the combined enterprises but only the sales of the concern at the final stage of production. The less integrated the concern, therefore, other things being equal, the lower the ratio of total assets to sales. It may be noted also that the ratio of fixed capital assets to sales generally rises more sharply with size than the ratio of total assets to sales.[6] As would be expected, the turnover of total assets is substantially higher among the income than among the deficit corporations of comparable groups.

INTERACTION BETWEEN CLASSIFICATIONS

Although a three-way classification of the data permits the isolation of factors which we have labeled "industry," "size," and "profitability," it is clear that a possibility of correlation or "interaction" between these variables remains, rendering interpretation of the results ambiguous to some extent. For example, the 61 minor industrial divisions differ with respect to average size and profitability. Can we say to what extent apparent industrial differences are related to differences in size and profitability? Similarly, within major industrial groups, to what extent are variations with size possibly related to concealed minor industrial divisions of different average asset sizes or to the fact that there is a correlation between size and profitability? Even the comparison of income and deficit corporations of minor industrial divisions is not free from ambiguity, since the deficit corporations of a given division have been found to be consistently of smaller average asset size than the income corporations. On the other hand, if we compare the income and deficit corporations of given size classes among the major industrial groups, thus holding size constant, some of the differences may be due to the different industrial composition of the income and deficit groups.

In an attempt to determine whether apparent variations with industry, size, and profitability could conceivably be related to one another, the rankings of each ratio according to industry were compared with the industrial rankings by asset size and by profitability.[7] Also, size variations within major industrial groups were examined to see whether they might be due to concealed minor industrial divisions of different average asset size; and data on profitability by size classes within the major industrial groups were used to determine whether variations of ratios with size are also associated with variations in profitability.

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[6] The explanations of the variations in the total assets/sales ratio which have been given would seem to apply most forcefully to corporations of fairly large size. Yet the same type of variation is found as between concerns with $50,000 and $500,000 total assets. A consideration of specific industries, however, indicates a basis for integration effects even among such narrow size ranges. The smallest concerns in the clothing industry, for example, are engaged in producing part of a garment on a subcontracting basis. They operate in a hand-to-mouth manner, passing the product upon which they are working, as soon as it is completed, to the next higher stage of manufacture. They hold no sizable stocks of inventory, as all work is done to order. A similar explanation probably applies to such industries as textiles, motor vehicles, metals, and printing. In addition to integration other factors, such as intercorporate investments, operate to some degree even among the smaller size classes.

For data on the relationship between corporate size and profitability we relied on tabulations for the year 1936 made by Professor Crum.[8] We defined profitability as the ratio of net income to average net worth. (See Table C-25 in Data Book.) If a given ratio varied erratically with size, we examined the corresponding profitability data to see if they could account for the variations. If the size variations of a given ratio were regular and consistent, an examination was made of the corresponding profitability data to see whether the variations were consistent with each other. Income corporations exhibit relatively little variation, although profitability shows a tendency to decline slightly with size. Among deficit corporations profitability rises sharply with corporate size, particularly for corporations with total assets of less than $1,000,000. If a given ratio showed a similar variation for both income and deficit classes, its variation with size was considered to be independent of profitability. Generally, the financial ratios that do vary systematically with size behave in the same manner in both income and deficit divisions. The fact that the profit ratio varies differently in these two groups provides evidence that apparent size variations are not associated with profitability differences.

Since differences in average asset size and profitability among the minor industrial divisions are substantial, the question naturally arises whether some of the industrial variations may be related to these factors.[9] We have found that the correlation between average asset size and profitability

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[7] These "tests" by inspection are, to be sure, of a crude sort. Only direct correlations are observed. That is, we do not consider to what extent, if any, industrial variations are related in part to average asset size and in part to average profitability. The rankings of minor industrial divisions according to average asset size and profitability are given in Table C-27 in Data Book.

[8] See W. L. Crum, *Corporate Size and Earning Power* (Cambridge, Mass., 1939). For our study figures for 1937 would have been preferable; but since such data were not readily available, we used the 1936 figures, as the relationship between profitability and size has been found to be highly stable over short periods of time.

[9] Cases in which statistically significant relationships appear are listed below:

Relationship with Size

Direct	*Inverse*
Capital assets/total assets	Cash/total assets
Surplus/total assets	Receivables/total assets
Net worth/total assets	Current assets/total assets
Inventory/sales	Notes payable/total assets
Capital assets/sales	Current liabilities/total assets
Current assets/sales	
Total assets/sales	

(concluded on next page)

among the minor industrial divisions is negligible. This fact is important, since the interpretation of relationships would be ambiguous otherwise. Several relationships are of particular interest. The larger the average size of an industry and the higher its profitability, the smaller the proportion which notes payable form as a percentage of total liabilities. In the case of the notes payable/sales ratio there is also an inverse relationship with profitability. Cash and marketable securities are a smaller fraction of assets in the less profitable industrial divisions but are not affected by differences in average asset size. The larger the average size of corporation, the lower is the inventory turnover. On the other hand, differences in the level of profitability among industries are not reflected in differences in rates of turnover. The larger the average asset size and the more profitable an industry is, the larger is the proportion of surplus and of net worth as a whole to total liabilities.

Other types of interaction, particularly between size and industry, can be cited. The effect of size upon capital structure may vary from industry to industry. Some major industrial groups exhibit sharper and more consistent size variations than others. In certain cases the ratios of the major industrial groups tend to converge with increasing corporate size, indicating that industrial differences are less important among large concerns with a more complicated product structure. Finally, the output of a $50,000 concern in a major industrial group is in all probability greatly different from that of a $10,000,000 concern in the same industry; if so, size and industrial differences are associated. An extreme example of interaction is found in the "service" industry which contains at least two broadly distinct subdivisions: (1) relatively small personal service corporations such as accountants, advertising firms, and other professional groups; (2) large service corporations such as hotels and motion picture distributors.

SIGNIFICANCE AND STABILITY OF THE RESULTS

Throughout the analysis it was necessary to appraise the significance of statistical results in an objective fashion. Certain of the statistical tools that were employed are described here briefly.

Use was made frequently of the *coefficient of rank correlation*, which provides a measure of the degree to which there is similarity in the rankings

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[9] (concluded)

Relationship with Profitability

Direct	*Inverse*
Cash/total assets	Receivables/total assets
Marketable securities/total assets	Notes payable/total assets
Intercorporate investments/total assets	Notes payable/sales
Current assets/current liabilities	
Surplus/total assets	
Net worth/total assets	

The values of the rank correlation coefficients on which this list is based are given in Appendix D.

of the minor industrial divisions according to two balance-sheet characteristics: for example, according to inventory holdings and notes payable, or to inventory holdings and average asset size. A summary table of the rank correlation coefficients that were computed will be found in Appendix D.

Tests of significance, in the form of the *analysis of variance*,[10] were carried out to provide an objective comparison of the variation of the ratio *between* classes as against the variation *within* classes.[11] When the difference between classes was sufficiently great, compared with the variation within classes, to contradict the assumption that the ratios in the two classes might have been selected at random from a population of ratios, the difference was considered significant.[12] The significance of industry, size, and profitability classifications for a number of ratios was tested in this manner. Using the analysis of variance, we also tested a rough classification of the minor industrial divisions of the Internal Revenue data according to producers' and consumers' goods industries. The test of a division according to perishable and durable goods also would have been of interest, but such a test requires a more detailed industrial classification than was available.

The appraisal of variations in balance-sheet ratios among different size classes presents certain difficulties, since size variations must be considered not only with respect to their consistency but also with respect to their range. To introduce objectivity into the appraisal of size variations within the major industrial groups, a ratio's movement was called erratic if it changed its direction three or more times out of eight possible changes. In the absence of formal tests of the significance of mean differences between size classes, no specific criteria were adopted with respect to the significance of the range of variation of ratios. Variations were described as "extreme," "moderate," "mild," etc., without objective definitions of these adjectives.

In describing the industrial variations in financial structure, it often was found useful to summarize the minor industrial groups as if they formed a frequency distribution and to state the first and third quartiles and, occasionally, the range of variation. The first and third quartiles were taken as the fifteenth and forty-fifth industrial divisions, when the minor industrial divisions were ranked from low to high according to a given ratio. In giving the range of variation, very extreme items which represent unimportant industrial divisions, such as commission merchants, were omitted when their values were far out of line with the other industrial divisions. To secure an objective measure of the degree of industrial variation, an index of relative variation was computed by expressing the interquartile range as a percentage of the median ratio for a given industrial group. (See Table 2, p. 10.)

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[10] For a description of this method, see R. A. Fisher, *Statistical Methods for Research Workers* (London, 1936) Chapter 8, or F. C. Mills, *Statistical Methods* (New York, revised edition, 1938) Chapter 15.

[11] It was impossible to test in a formal manner the significance of differences of ratios between the various classifications of the Bureau of Internal Revenue since data on individual corporations are lacking. We carried out tests, however, using the frequency distributions of individual corporations published in *Statistics of American Listed Corporations*, Part 1, issued by the Securities and Exchange Commission. For a detailed discussion of this source see Appendix A.

[12] In appraising results a 5 percent level of probability was used. That is, the difference between the mean ratios of two classes was considered significant if the probability that they would differ from each other as much as they did—assuming that the group of ratios is a random sample—was less than five in one hundred.

Appendix C

A COMPARISON OF CONSOLIDATED AND UNCONSOLIDATED BALANCE SHEETS

IN 1934 THE BUREAU OF INTERNAL REVENUE discontinued the privilege of filing consolidated returns. With the aid of extensive tables published in *Statistics of Income for 1934*, Part 2, some of the differences between consolidated and unconsolidated statements can be appraised.[1] The importance of consolidated returns prior to 1934 is indicated by the fact that, over the period 1928-33, 44 percent of the gross income of all corporations was reported on a consolidated basis.[2] The shift in the basis of reporting affected not only the capital structure of corporations as a whole but also the comparative capital structure of different size classes and industry groups. There has been some offsetting tendency in recent years to eliminate subsidiaries altogether by consolidation with the parent corporation, in order to minimize taxes which would otherwise be paid on intercorporate dividends. This development, however, has been most pronounced since 1937, as tax rates have progressively increased, and would not affect the comparisons between 1934 and 1937.

The shift from a consolidated to an unconsolidated basis affected both the absolute dollar volume of various balance-sheet accounts and their size relative to each other. Since a detailed account of these changes in individual industries is too cumbersome, we shall confine our analysis to manufacturing corporations as a whole. Table C-1 presents balance-sheet data for manufacturing corporations with consolidated subsidiaries in 1933, and similar data for the same group of corporations and their subsidiaries as they appeared on an unconsolidated basis in 1934. The effect of this shift—a process which, for convenience, we may call deconsolidation—is, of course, combined with whatever other changes may have occurred in the various accounts of these corporations between 1933 and 1934.[3] A check on the magnitude of the purely temporal changes is provided, however, in Table C-2, which presents data for manufacturing corporations which were unconsolidated in both 1933 and 1934.

[1] See *Statistics of Income for 1934*, Part 2 (1937) pp. 113-94.

[2] By 1933 this percentage had declined slightly to 38 percent, probably in response to increased penalties imposed upon the filing of consolidated returns. See C. J. Hynning, *The Taxation of Corporate Enterprise*, Temporary National Economic Committee, Monograph No. 9 (Washington, 1941) Chapter 3.

[3] Both the 1933 and the 1934 data are grouped by their 1933 industrial classification, so that the industrial shifts resulting from deconsolidation are eliminated. These will be discussed separately below.

Table C-1—BALANCE-SHEET EFFECT OF ELIMINATION OF CONSOLIDATED RETURNS, COMBINED WITH TEMPORAL CHANGE, 1933-34, ALL MANUFACTURING CORPORATIONS (dollar figures in millions)

	1933[a] (1)	*1934*[b] (2)	*Change 1933-34* (2)-(1)	*Percentage Distribution of Assets and Liabilities* 1933	1934
Number of corporations	2,407	7,570	5,163		
Cash	$1,518	$1,613	$ 95	4.7	3.9
Receivables	3,510	6,969	3,459	10.9	16.8
Inventory	3,792	4,062	270	11.7	9.8
Tax-exempt investments	710	696	−14	2.2	1.7
Total current assets	9,530	13,340	3,810	29.5	32.2
Other investments	6,681	12,601	5,920	20.7	30.4
Capital assets	14,403	13,136	−1,267	44.5	31.8
Other assets	1,712	2,334	621	5.3	5.6
Total assets	32,326	41,411	9,084	100.0	100.0
Notes and accounts payable	2,870	6,797	3,927	8.9	16.4
Bonds, mortgages	3,496	3,674	178	10.8	8.9
Other liabilities	2,103	2,802	699	6.5	6.8
Capital stock	16,545	19,798	3,253	51.2	47.8
Surplus less deficit	7,311	8,340	1,029	22.6	20.1
Total liabilities	32,326	41,411	9,084	100.0	100.0
Sales	15,676	20,832	5,156		

[a] 1933 (consolidated) returns for corporations reporting on a consolidated basis in 1933, by their 1933 industrial classification, from *Statistics of Income for 1934*, Part 2, Table 11, p. 146.

[b] 1934 (unconsolidated) returns for corporations reporting on a consolidated basis in 1933, by their 1933 industrial classification, from *Statistics of Income for 1934*, Part 2, Table 14, p. 186.

There were 2,407 manufacturing corporations with consolidated subsidiaries in 1933, and the total assets of these consolidated subsidiaries amounted to approximately $6,000,000,000.[4] Deconsolidation resulted in the approximate doubling of the dollar volume of both current receivables and current payables, which in consolidated balance sheets had about canceled each other out. The ratio of current receivables and current payables to total assets was also sharply increased. The increase in receivables was more than proportionate to the increase in sales, the ratio of receivables to sales rising from 22 to 33 percent. (Table C-2 reveals that the ratio of receivables to sales for unconsolidated corporations actually fell from 18 to 15 percent between 1933 and 1934.) The increase in current payables would normally be expected to be identical with the increase in current receivables, apart from differences in temporal change. Actually it is larger by some $500,000,000, which may possibly be due to some unspecified shift in classification of short-term and long-term liabilities.

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[4] This may be an underestimate, since the prohibition of consolidated returns may have induced some corporations to merge their subsidiaries, which would therefore not appear in the increase in "other investments" that took place between 1933 and 1934.

The sharp increase in "other investments" expresses the very fact of deconsolidation. The reduction in capital assets of $1,300,000,000 probably represents a downward revaluation of capital assets, reflecting the consequences of the depression, since there is no reason to assume that fixed capital assets would be reduced by deconsolidation. The plausibility of this explanation is supported by the decrease of fixed capital assets between 1933 and 1934 among unconsolidated corporations, shown in Table C-2.

Table C-2—TEMPORAL CHANGE IN BALANCE SHEETS OF CORPORATIONS UNCONSOLIDATED IN 1933 AND 1934, ALL MANUFACTURING CORPORATIONS
(dollar figures in millions)

	1933[a] (1)	*1934*[b] (2)	*Change 1933-34* (2)-(1)	*Percentage Distribution of Assets and Liabilities* 1933	1934
Number of corporations	80,429	80,801	372		
Cash	$1,567	$1,758	$ 191	6.2	7.0
Receivables	3,255	3,209	−46	12.8	12.7
Inventory	4,292	4,549	257	16.9	18.0
Tax-exempt investments	1,273	1,086	−187	5.0	4.3
Total current assets	10,387	10,602	215	40.8	42.0
Other investments	2,817	2,747	−70	11.1	10.9
Capital assets	9,982	9,753	−229	39.3	38.7
Other assets	2,241	2,112	−129	8.8	8.4
Total assets	25,427	25,215	−212	100.0	100.0
Notes and accounts payable	2,852	2,855	3	11.2	11.3
Bonds, mortgages	1,525	1,448	−77	6.0	5.8
Other liabilities	1,564	1,721	157	6.2	6.8
Capital stock	13,853	13,549	−304	54.5	53.7
Surplus less deficit	5,632	5,642	10	22.1	22.4
Total liabilities	25,427	25,215	−212	100.0	100.0
Sales	18,256	22,116	3,860		

[a] 1933 (unconsolidated) returns for corporations not reporting on a consolidated basis in 1933, by their 1933 industrial classification, from *Statistics of Income for 1934*, Part 2, Table 11, p. 154.

[b] 1934 (unconsolidated) returns for corporations not reporting on a consolidated basis in 1933, by their 1934 industrial classification, from *Statistics of Income for 1934*, Part 2, Table 12, p. 170.

The increase in capital stock and surplus, like that in "other investments," is, of course, the direct consequence of deconsolidation. Although the dollar volume of capital stock and surplus is increased by deconsolidation, its proportion to total assets actually declines somewhat, because of increases in the current liabilities. In a similar manner, fixed capital assets, although relatively unchanged so far as dollar volume is concerned, may decrease as a proportion of total assets because of the rise in current assets.

The effects of deconsolidation on the distribution of corporate assets and liabilities by industry were of two types: First, a number of corporations were shifted from one industrial classification to another. Thus, a number of subsidiaries of predominantly manufacturing corporations were shifted to trade and mining. Second, the relative size of balance-sheet accounts in different branches of manufacturing was changed, owing to the fact that some branches of industry practiced consolidation more extensively and/or had a larger number of consolidated subsidiaries than others.

The first effect is illustrated in Table C-3, which compares the 1934 returns of manufacturing corporations that reported on a consolidated

Table C-3—EFFECT OF DECONSOLIDATION ON THE FINANCIAL STRUCTURE OF MANUFACTURING CORPORATIONS AS SHOWN BY INDUSTRIAL CLASSIFICATIONS OF 1933 AND 1934
(dollar figures in millions)

	All Manufacturing Corporations, 1934			*Percentage Distribution of Assets and Liabilities*		
	By 1933 Industrial Classification[a] (1)	By 1934 Industrial Classification[b] (2)	Change 1933-34 (2)-(1)	1933 Classification	1934 Classification	Change[c] 1933-34
Number of firms	7,570	4,697	−2,873			
Cash	$1,613	$1,248	$ −365	3.9	4.6	2.6
Receivables	6,969	4,274	−2,695	16.8	15.6	19.1
Inventory	4,062	3,770	−292	9.8	13.8	2.1
Tax-exempt investments	696	517	−179	1.7	1.9	1.3
Total current assets	13,340	9,809	−3,531	32.2	35.9	25.0
Other investments	12,601	5,307	−7,294	30.5	19.4	51.7
Capital assets	13,136	10,698	−2,438	31.7	39.2	17.3
Other assets	2,334	1,494	−839	5.6	5.5	6.0
Total assets	41,411	27,308	−14,103	100.0	100.0	100.0
Notes and accounts payable	6,797	3,912	−2,885	16.4	14.3	20.5
Bonds, mortgages	3,674	2,577	−1,097	8.9	9.4	7.8
Other liabilities	2,802	1,858	−944	6.8	6.8	6.7
Capital stock	19,798	13,382	−6,416	47.8	49.0	45.5
Surplus less deficit	8,340	5,579	−2,761	20.1	20.5	19.5
Total liabilities	41,411	27,308	−14,103	100.0	100.0	100.0
Sales	20,832	17,334	−3,498			

[a] 1934 (unconsolidated) returns of corporations which reported on a consolidated basis in 1933, according to their 1933 industrial classification, from *Statistics of Income for 1934*, Part 2, Table 14, p. 186.

[b] 1934 (unconsolidated) returns of corporations which reported on a consolidated basis in 1933, according to their 1934 industrial classification, i.e., those which remained in the manufacturing classification, from *Statistics of Income for 1934*, Part 2, Table 12, p. 162.

[c] As a percent of change in total assets.

basis in 1933, industrially distributed by their 1934 classification, with the same group of corporations, distributed by their 1933 industrial classification. Manufacturing lost 2,873 corporations with $14,000,000,000 of assets to other industrial classes. These corporations underwent a more than proportionate decrease of receivables and payables, reflecting the fact that trading subsidiaries were lost to a large extent.

Table C-4 presents what may be called the gross effect of deconsolidation for all manufacturing corporations combined with the temporal change in balance-sheet accounts from 1933 to 1934. This expresses the combination of the balance-sheet effect of deconsolidation, resulting in an increase of $9,000,000,000 of assets, with the industrial effect, resulting in a decrease of some $14,000,000,000, giving a net decrease of $5,000,000,000. The similarity in the percentage distribution for 1933 and 1934 is striking, the increase in the proportion of receivables and payables being very moderate and reflecting the shift from manufacturing to trade of some trading sub-

Table C-4—Gross Effect of Elimination of Consolidated Returns, Combined with Temporal Change, 1933-34, All Manufacturing Corporations
(dollar figures in millions)

	1933[a] (1)	*1934*[b] (2)	*Change 1933-34* (2)-(1)	*Percentage Distribution of Assets and Liabilities* 1933	1934
Number of corporations	82,836	85,498	2,662		
Cash	$3,084	$3,006	$ −78	5.3	5.7
Receivables	6,765	7,483	718	11.7	14.2
Inventory	8,084	8,319	235	14.0	15.9
Tax-exempt investments	1,983	1,603	−380	3.5	3.1
Total current assets	19,916	20,411	495	34.5	38.9
Other investments	9,499	8,055	−1,444	16.5	15.3
Capital assets	24,384	20,450	−3,933	42.2	38.9
Other assets	3,953	3,607	−346	6.8	6.9
Total assets	57,752	52,523	−5,228	100.0	100.0
Notes and accounts payable	5,722	6,768	1,046	9.9	12.9
Bonds, mortgages	5,021	4,025	−996	8.7	7.7
Other liabilities	3,669	3,580	−89	6.4	6.8
Capital stock	30,398	26,930	−3,468	52.6	51.3
Surplus less deficit	12,942	11,220	−1,721	22.4	21.3
Total liabilities	57,752	52,523	−5,228	100.0	100.0
Sales	32,361	39,042	6,681		

[a] 1933 (consolidated) returns of all manufacturing corporations, by their 1933 industrial classification, from *Statistics of Income for 1933*, Table 15, p. 161.

[b] 1934 (unconsolidated) returns of all manufacturing corporations, by their 1934 industrial classification. This excludes those (previously consolidated) subsidiaries of manufacturing corporations which were classified under trade or mining or elsewhere in 1934. From *Statistics of Income for 1934*, Part 2, Table 4, p. 67.

sidiaries. Thus a fairly high degree of comparability is apparent in the balance-sheet proportions of the manufacturing data prior and subsequent to deconsolidation.

Space does not permit here discussion of the balance-sheet effect of deconsolidation upon the subdivisions of manufacturing and other industrial groups, although data are available in *Statistics of Income for 1934.* The data in Table C-5, however, indicate the extent to which subsidiaries are important in the various broad industrial groups. The number of deconsolidated subsidiaries per parent corporation did not vary greatly, except as between transportation and public utilities and all other corporations. The relative importance of deconsolidated subsidiaries, measured as a percentage

Table C-5—THE INDUSTRIAL DISTRIBUTION OF SUBSIDIARIES, 1933

Industry	*Number of Subsidiaries Deconsolidated in 1934*[a]	*Number of Deconsolidated Subsidiaries per Parent Corporation*[a]	*Approximate Investment in Deconsolidated Subsidiaries as Percent of Total Assets of Industry, 1933*[b]
Mining and quarrying	*848*	*2.2*	*14.8*
All manufacturing	*5,163*	*2.1*	*10.2*
Food, beverages, tobacco	975	2.7	12.3
Textiles	299	1.1	1.8
Leather	117	1.6	2.6
Rubber	86	2.4	5.9
Forest products	283	1.5	2.2
Paper, pulp	206	2.4	15.6
Printing and publishing	391	1.9	1.3
Chemicals, petroleum, and allied products	923	3.1	14.7
Stone, clay, glass	162	1.6	5.9
Metals	1,432	2.3	11.2
Construction	*176*	*1.1*	[c]
Trade	*1,732*	*1.6*	*3.6*
Service	*1,251*	*2.5*	*3.4*
Transportation and public utilities	*3,283*	*5.3*	*18.0*
Finance	*2,643*	*1.6*	[c]
All corporations	*16,147*	*2.4*	*7.6*

[a] See *Statistics of Income for 1934*, Part 2, Tables 11 and 14, pp. 146 ff. and 186 ff.

[b] Approximate investment in subsidiaries is the difference in "other investments" between consolidated and unconsolidated balance sheets, as reported in the tables cited in footnote a.

[c] An actual decrease in "other investments" occurred in these groups when deconsolidated. This may be due to nonreporting of a few large concerns or to the decrease (revaluation) in the subsidiaries' net worth.

of the total assets of the various industrial groups, exhibits wider variation. Subsidiaries were particularly important in mining and quarrying, transportation and public utilities, paper and pulp, chemicals and petroleum, and food, beverages, and tobacco.

Since the bulk of the subsidiaries are owned by parent corporations in the upper size classes, the variations with size of balance-sheet accounts in unconsolidated statements might well be expected to differ from those in consolidated statements. The item of intercorporate investments would be greater in unconsolidated balance sheets, and most other asset items would accordingly comprise a smaller proportion of total assets of the large corporations. The rise in fixed capital assets as a percentage of total assets might be expected to be sharper in consolidated statements. On the other hand, as shown in Table C-1, deconsolidation sharply increased the proportion of

Table C-6—VARIATION WITH CORPORATE SIZE OF THE RATIO OF INTERCORPORATE INVESTMENTS TO TOTAL ASSETS, CONSOLIDATED AND UNCONSOLIDATED BALANCE SHEETS
(in percent of total assets)

	All Manufacturing Corporations[b]			
Asset Size[a] (in thousands)	1931—Consolidated		1937—Unconsolidated	
	Income	Deficit	Income	Deficit
Under $50	2.4	2.0	2.3	2.2
50–100	3.9	3.1	3.0	3.4
100–250	5.3	4.6	4.4	4.6
250–500	6.9	5.8	5.8	5.8
500–1,000	7.9	6.8	7.1	6.9
1,000–5,000	9.7	8.9	8.8	9.2
5,000–10,000	9.9	9.9	12.7	12.4
10,000–50,000	14.3	11.1	14.5	13.8
50,000–100,000	21.6	20.3	16.5	12.5
100,000 and over			23.9	14.6

Asset Size[a] (in millions)	*Listed Manufacturing Corporations, Consolidated Basis, 1937*[c]
Under $1	1.7
1– 3	1.2
3– 5	1.5
5– 10	1.3
10– 20	3.7
20– 50	2.2
50–100	3.1
100–200	1.9
200–500	2.9
500 and over	2.8

[a] Each size class is inclusive of the lower limit and exclusive of the upper.

[b] From *Source Book of Statistics of Income.*

[c] From *Statistics of American Listed Corporations,* Table 64.

receivables and current payables to total assets, which resulted in a higher ratio for total current assets and liabilities in the unconsolidated 1934 returns. Consequently it can be inferred that the decline in accounts receivable and accounts payable as a proportion of total assets, which we have observed in the variations with size in the 1937 data, would be even more pronounced if the balance sheets were consolidated.

Clearly, then, a comparison of 1931 (consolidated) statements and 1937 (unconsolidated) statements from Internal Revenue data is of interest. In Table C-6, the variation of the ratio of intercorporate investments to total assets is presented for the two years; and, in addition, data are tabulated for the SEC's listed manufacturing corporations, which are permitted to report on a consolidated basis. Quite contrary to expectations, the variation in the Internal Revenue data in 1931 and 1937 was approximately the same, with respect both to the absolute level and to the nature of the

Table C-7—VARIATION WITH CORPORATE SIZE OF THE RATIO OF RECEIVABLES AND OF PAYABLES TO TOTAL ASSETS, CONSOLIDATED AND UNCONSOLIDATED BALANCE SHEETS
(in percent of total assets)

Asset Size[a] (in thousands)	*All Manufacturing Corporations*[b]			
	1931—Consolidated		1937—Unconsolidated	
	Income	Deficit	Income	Deficit
	Accounts Receivable			
Under $50	25.7	22.1	26.7	23.2
50–100	24.1	19.6	23.4	20.2
100–250	21.4	17.5	20.4	16.8
250–500	19.1	15.0	19.1	15.1
500–1,000	17.2	13.6	16.0	12.7
1,000–5,000	14.5	11.5	14.6	12.4
5,000–10,000	12.6	10.1	12.2	9.9
10,000–50,000	10.6	9.5	11.0	10.2
50,000–100,000	15.3	9.1	9.6	6.2
100,000 and over			10.6	18.5
	Notes and Accounts Payable			
Under $50	22.5	39.6	27.4	43.3
50–100	19.4	30.2	22.5	35.2
100–250	15.8	24.7	19.8	31.1
250–500	12.8	20.9	17.0	24.8
500–1,000	10.2	16.8	14.8	23.5
1,000–5,000	7.4	12.5	12.8	19.2
5,000–10,000	5.5	9.5	9.6	12.6
10,000–50,000	5.0	9.0	8.9	14.8
50,000–100,000	8.4	5.7	9.3	8.0
100,000 and over			11.2	16.3

[a] Each size class is inclusive of the lower limit and exclusive of the upper.

[b] From *Statistics of Income for 1931*, *Statistics of Income for 1937*, Part 2, and *Source Book of Statistics of Income*.

increase with corporate size. This result indicates that unconsolidated balance sheets were filed to a great extent even when the privilege of consolidation existed. The intercorporate investments in the consolidated SEC data follow the expected pattern more closely, the ratio of investments to total assets being lower and its variation with size being insignificant.

The statement was made above that on the basis of the comparison of 1933 (consolidated) and 1934 (unconsolidated) data in Table C-1 both accounts receivable and accounts payable would be expected to show a sharper decline with size among consolidated balance sheets. This inference was based on the fact that most of the subsidiaries are held by the large corporations and are themselves relatively large. A comparison of the 1931 (consolidated) and 1937 (unconsolidated) returns, shown in Table C-7, does not confirm this expectation. We have already seen from Table C-6 that there is much greater similarity than expected between the pattern of intercorporate investment in 1931 and 1937. Apparently this is true also for receivables and payables. On the other hand, Table C-1 shows that the discontinuation of consolidated returns in 1934 caused a substantially increased percentage of receivables and payables. It is difficult to reconcile these two facts except on the assumption that industrial shifts, changes in the size of subsidiaries, and other factors resulted in an important reduction of receivables and payables among large corporations in 1937.

Appendix D

COEFFICIENTS OF RANK CORRELATION

Table D-1—COEFFICIENTS OF RANK CORRELATION FOR SELECTED FINANCIAL RATIOS AMONG MINOR INDUSTRIAL DIVISIONS[a]

Financial Ratio	*Coefficient of Rank Correlation*			
	Between Income and Deficit Corporations for 1937	With Average Asset Size of Corporation for 1937[b]	With Ratio of Net Income to Net Worth for 1937[b]	Between 1937 and 1931[c]
Cash/total assets	.51	−.28	.30	.70
Government securities/total assets	.31	−.12	.47	.53
Cash plus government securities/total assets	.48	−.41		
Receivables/total assets	.80	−.41	−.55	.86
Receivables/sales	.79	.07	.00	.80
Inventory/total assets	.88	.05	.02	.84
Average inventory/sales	.64	.37	.18	.73
Other investments/total assets	.32	.21	.31	.61
Capital assets/total assets	.84	.32	−.26	.92
Capital assets/sales	.90	.44	−.11	

(concluded on next page)

Table D-1 (concluded)—COEFFICIENTS OF RANK CORRELATION FOR SELECTED FINANCIAL RATIOS AMONG MINOR INDUSTRIAL DIVISIONS[a]

Financial Ratio	*Coefficient of Rank Correlation*			
	Between Income and Deficit Corporations for 1937	With Average Asset Size of Corporation for 1937[b]	With Ratio of Net Income to Net Worth for 1937[b]	Between 1937 and 1931[c]
Notes payable/total assets	.40	−.52	−.34	
Notes payable/sales	.24	−.09	−.34	
Accounts payable/total assets	.44	−.43	−.14	
Accounts payable/sales	.51	.07	−.17	
Long-term debt/total assets	.77	.15	−.28	
Capital stock/total assets	.38	.00	−.02	
Surplus/total assets	.19	.45	.42	
Net worth/total assets	.52	.37	.45	
Current assets/current liabilities	.51	.26	.38	.78
Invested capital/capital assets	.68			
Net income/net worth	−.20			.31
Total assets/sales	.89	.50	.08	.85
Average asset size of corporation	.75			
Current assets/total assets		−.28	.05	
Current assets/sales		.34	.24	
Current liabilities/total assets		−.54	−.27	
Current liabilities/sales		.14	−.15	
Notes and accounts payable/total assets				.67
Notes and accounts payable/sales				.71
Net worth/total debt				.72

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[a] For a list of the 61 minor industrial divisions, see Appendix E. The standard error of the rank correlation coefficient for 61 cases is 0.13.

[b] Based upon ratios for income and deficit corporations combined as given in the Data Book (described in Chap. 1, p. 2, fn. 1).

[c] Based upon ratios for income and deficit corporations combined. Data for 1931 are derived from *Source Book of Statistics of Income for 1931.*

Table D-2—COEFFICIENTS OF RANK CORRELATION BETWEEN SELECTED BALANCE-SHEET RATIOS[a]

Ratios	*Coefficient of Rank Correlation*
Inventory/total assets with inventory/sales	.65
Receivables/total assets with receivables/sales	.27
Accounts payable/total assets with accounts payable/sales	.34
Notes payable/total assets with notes payable/sales	.48
Inventory/total assets with notes payable/total assets	.43
Inventory/sales with notes payable/sales	.17
Inventory/total assets with receivables/total assets	.43
Inventory/sales with receivables/sales	—.03
Accounts payable/sales with receivables/sales	.59
Accounts payable/sales with notes payable/sales	.42
Accounts payable/total assets with notes payable/total assets	.39
Current assets/total assets with current liabilities/total assets	.49
Current assets/sales with current liabilities/sales	.48
Long-term debt/total assets with notes and accounts payable/total assets	—.05
Long-term debt/total assets with capital stock/total assets	—.22
Long-term debt/total assets with fixed capital assets/total assets	.42
Capital stock/total assets with surplus/total assets	—.12

[a] The computations are based upon ratios for income and deficit corporations combined, as given in the tables in Data Book (described in Chap. 1, p. 2, fn. 1).

Appendix E

CLASSIFICATION OF INDUSTRIES BY MAJOR AND MINOR INDUSTRIAL GROUPS

MAJOR INDUSTRIAL GROUPS

The major industrial groups upon which this study has been based are:

Food
Liquors
Tobacco
Textiles
Clothing
Leather
Rubber
Forest products
Paper
Printing
Chemicals
Petroleum
Stone, clay, glass
Metals
Motor vehicles
Mining
Construction
Wholesale trade
Retail trade

DIFFERENCES IN THE FINANCIAL STRUCTURE OF PRODUCERS' AND CONSUMERS' GOODS INDUSTRIES

To test whether the financial structure of an industry differs according to whether it is primarily engaged in making producers' or consumers' goods, a rough classification of the 48 minor divisions in manufacturing has been made, and the difference between the average value of selected ratios in the two groups has been tested statistically. The classification employed and the results of the statistical tests, based on the computation of R. A. Fisher's t-coefficient, are listed below. A 5 percent level of statistical significance was employed.

Classification of Minor Industrial Groups According to Producers' and Consumers' Goods Industries

Producers' Goods

Chemicals
Paints, varnishes
Fertilizers
Stone, clay, glass
Iron and steel
Locomotives and r.r. equipment
Factory machinery
Agricultural machinery
Electrical machinery
Miscellaneous machinery
Office equipment
Metal building materials
Hardware
Other metals
Airplanes
Shipbuilding

Consumers' Goods

Bakery products
Canned products
Mill products
Packing house products
Sugar refining
Other food
Soft drinks
Liquors
Tobacco products
Cotton goods
Woolens and worsteds
Silk and rayon
Carpets
Textiles, not elsewhere classified
Knit goods
Clothing and apparel
Boots, shoes
Other leather products
Tires and tubes
Other rubber products
Bone, celluloid, etc.
Sawmill products
Other wood products
Paper, pulp, and products
Printing and publishing
Allied chemicals
Petroleum and other oil products
Household machinery
Precious metals
Motor vehicles
Radios
Musical instruments

SIGNIFICANCE OF DIFFERENCES IN FINANCIAL RATIOS BETWEEN PRODUCERS' AND CONSUMERS' GOODS INDUSTRIES

Ratio	*Result*	*Average Ratio* Producers' Goods	*Average Ratio* Consumers' Goods
Receivables/total assets	Nonsignificant	13.8%	14.5%
Receivables/sales	Significant	15.8	11.5
Inventory/total assets	Nonsignificant	22.5	24.8
Inventory/sales	Significant	22.2	16.3
Fixed capital assets/total assets	Nonsignificant	36.3	34.1
Fixed capital assets/sales	Significant	43.0	30.3
Other investments/total assets	Nonsignificant	13.7	12.3
Notes payable/total assets	Significant	4.0	6.5
Notes payable/sales	Nonsignificant	4.7	5.2
Accounts payable/sales	Significant	9.1	6.5
Bonds, mortgages/total assets	Nonsignificant	8.3	7.1
Capital stock/total assets	Nonsignificant	46.1	45.7
Net worth/total debt	Nonsignificant	3.3	3.0
Invested capital/fixed capital assets	Nonsignificant	244.2	278.6
Total assets/sales	Significant	111.0	71.5
Net income/net worth	Nonsignificant	8.7	6.0
Current assets/current liabilities[a]	Nonsignificant	2.8[a]	2.6[a]
Current assets/total assets	Nonsignificant	44.8	47.7
Current assets/sales	Significant	51.2	38.1
Current liabilities/total assets	Nonsignificant	16.7	18.8
Current liabilities/sales	Significant	19.2	13.4

[a] In times.

In addition to the 48 minor industrial divisions listed above, the following minor industrial divisions have been included in our study:

Oil and gas
Anthracite
Bituminous coal
Metal mining
Other mining
Mining, not elsewhere classified
Commission merchants
Wholesale trade
Retail trade
Wholesale and retail trade
All other trade
Construction
Other construction

The divisions of retail trade for which balance-sheet data are provided in *Statistics of Income for 1938* are as follows:

DIVISIONS OF RETAIL TRADE

Department stores, general merchandise
Limited price variety
Mail-order houses
Food stores
Package liquor
Drugstores
Apparel
Furniture, house furnishings
Eating and drinking places
Dealers in autos, accessories, tires, tubes, batteries
Filling stations
Hardware
Lumber and coal
Other retail
Retail not allocable

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